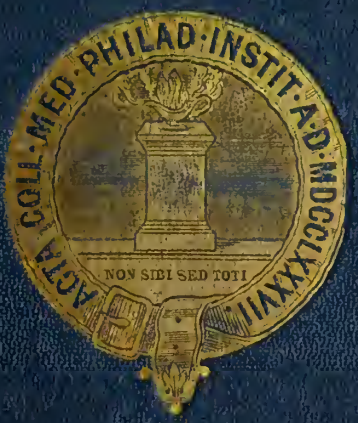
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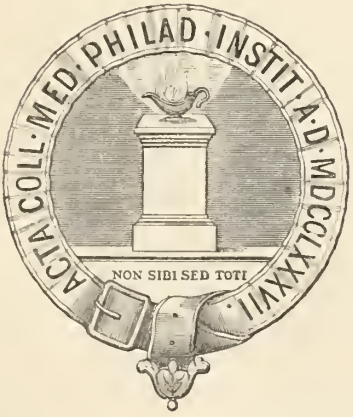

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COLLEGE OF PHYSICIANS OF PHILADELPHIA.

1876.

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11472

LIST

OF THE

PRESIDENTS OF THE COLLEGE FROM THE TIME OF ITS INSTITUTION.

ELECTED

1787. JOHN REDMAN, M.D.
1805. WILLIAM SHIPPEN, M.D.
1809. ADAM KUHN, M.D.
1818. THOMAS PARKE, M.D.
1835. THOMAS C. JAMES, M.D.*
1835. THOMAS T. HEWSON, M.D.
1848. GEORGE B. WOOD, M.D., LL.D.

* Died four months after his election.

FELLOWS

OF THE

COLLEGE OF PHYSICIANS OF PHILADELPHIA.

JULY, 1876.

[Non-Resident Fellows are marked thus (*).]

ELECTED

1870. Adler, John M., M.D.

1859. Agnew, D. Hayes, M.D., LL.D., Professor of Surgery in the University of Pennsylvania, Consulting Surgeon to the Orthopædic Hospital, and to the Philadelphia and Northern Dispensaries.

1876. Alison, Robert H., M.D., Assistant Physician to the Orthopædic Hospital and Infirmary for Nervous Diseases.

1867. Allen, Harrison, M.D., Professor of Comparative Anatomy and Zoology in the University of Pennsylvania, Surgeon to the Philadelphia Hospital and to St. Joseph's Hospital.

1873. Allis, Oscar H., M.D., Surgeon to the Presbyterian Hospital and to the Howard Hospital.

1869. Andrews, T. Hollingsworth, M.D., Demonstrator of Anatomy in the Jefferson Medical College, Surgeon for Out-Patients to the Pennsylvania Hospital, Surgeon to the Howard Hospital, Consulting Surgeon to the Hospital of the Good Shepherd, Radnor.

1872. Ashbridge, William, M.D., Physician to the German Hospital, Surgeon for Out-patients to the Pennsylvania Hospital.

1863. Ashhurst, John, Jr., M.D., Surgeon to the Episcopal Hospital and to the Children's Hospital, Consulting Surgeon to St. Christopher's Hospital and to the Hospital of the Good Shepherd, Radnor.

ELECTED

1865. Ashhurst, Samuel, M.D., Surgeon to the Episcopal Hospital.

1835. Ashmead, William, M.D.

1857. Atlee, Walter F., M.D., Consulting Physician and Surgeon to St. Luke's Hospital, Bethlehem.

1846. Atlee, Washington L., M.D.

1852. Bache, Thomas Hewson, M.D.

1873. Baxter, H. F., M.D.

1874. Beecher, A. C. W., M.D.

1860. Benner, Henry D., M.D.

1874. Bennett, W. H., M.D., Physician to St. Christopher's Hospital, Assistant Physician to the Episcopal Hospital.

1871. Bertolet, R. M., M.D., Physician to the German Hospital, Curator and Pathologist to the Philadelphia Hospital.

1851. Biddle, John B., M.D., Professor of Materia Medica and General Therapeutics in the Jefferson Medical College.

*1866. Black, J. J., M.D.

*1867. Boardman, Charles H., M.D.

1859. Boker, Charles S., M.D., Surgeon to St. Joseph's Hospital.

1864. Bolling, Robert, M.D.

1842. Bridges, Robert, M.D., Professor of Chemistry in the Philadelphia College of Pharmacy.

1856. Brinton, John H., M.D., Lecturer on Operative Surgery in the Jefferson Medical College, Surgeon to the Philadelphia Hospital and to St. Joseph's Hospital.

*1851. Bullock, William R., M.D.

1870. Burnett, C. H., M.D., Aurist to the Presbyterian Hospital, Surgeon to the Philadelphia Infirmary for Diseases of the Ear.

1875. Burns, Robert, M.D.

1863. Burpee, David, M.D., Physician to the Howard Hospital.

1838. Carson, Joseph, M.D., Emeritus Professor of Materia Medica and Pharmacy in the University of Pennsylvania.

ELECTED

1868. Cheston, D. Murray, M.D., Physician to the Children's Hospital.

1873. Clark, Leonardo S., M.D., Physician to the Charity Hospital.

1872. Cleemann, Richard A., M.D., Physician to St. Mary's Hospital.

*1842. Clymer, Meredith, M.D.

1827. Coates, Benjamin Hornor, M.D.

1871. Cohen, J. Solis, M.D., Lecturer on Laryngoscopy and Diseases of the Throat and Chest in the Jefferson Medical College, Physician to the German Hospital.

*1870. Corbit, William B., M.D.

*1857. Corse, James, M., M.D.

1866. Cruice, R. B., M.D., House Surgeon to St. Joseph's Hospital.

1873. Cruice, W. R., M.D.

1868. Cummiskey, James, M.D., Physician to St. Mary's Hospital.

1858. Da Costa, J. M., M.D., Professor of the Principles and Practice of Medicine in the Jefferson Medical College, Physician to the Pennsylvania Hospital, Consulting Physician to the Children's Hospital, and to the Northern Dispensary.

1859. Darrach, James, M.D., Consulting Surgeon to the Germantown Hospital.

1866. Darrach, William, M.D., Physician to the Germantown Hospital.

1874. Deakyne, A. C., M.D.

*1870. Deal, L. J., M.D.

1864. Downs, R. N., M.D., Consulting Physician to the Germantown Hospital.

1864. Duer, E. L., M.D., Accoucheur to the Philadelphia Hospital, Surgeon to the State Hospital for Women and Infants, Visiting Physician to the Preston Retreat.

1871. Duhring, L. A., M.D., Clinical Professor of Skin Diseases in the Hospital of the University of Pennsylvania, Physician to the Dispensary for Skin Diseases.

ELECTED

1863. Dunglison, Richard J., M.D.

*1871. Dunglison, Thomas R., M.D.

*1849. Dunott, Justus, M.D.

1860. Dunton, William R., M.D., Consulting Physician to the Germantown Hospital.

1842. Evans, Charles, M.D.

1868. Evans, H. Y., M.D., Physician to the Charity Hospital.

1872. Finn, W. H., M.D., Assistant Surgeon to the Episcopal Hospital.

1866. Fischer, Emil, M.D.

1862. Forbes, William S., M.D., Surgeon to the Episcopal Hospital.

1870. Ford, W. H., M.D.

1831. Fox, George, M.D.

1864. Fricke, Albert, M.D.

1870. Gardette, E. B., M.D.

1873. Gerhard, George S., M.D., Physician to the Orthopædic Hospital and Infirmary for Nervous Diseases, Assistant Physician to the Children's Hospital, Pathologist to the Presbyterian Hospital.

1864. Getchell, F. H., M.D., Clinical Lecturer on Obstetrics and Diseases of Women in the Jefferson Medical College, Obstetric Physician to the Catherine Street Dispensary.

*1846. Gibbons, Henry, M.D.

1863. Gilbert, W. Kent, M.D.

*1848. Given, Robert A., M.D.

*1854. Gobrecht, William H., M.D.

1868. Goodell, William, M.D., Clinical Professor of Diseases of Women and Children in the University of Pennsylvania, Physician in Charge of the Preston Retreat, Consulting Physician to the Lying-in Department of the Northern Dispensary.

1867. Goodman, H. Earnest, M.D., Surgeon to Wills Hospital and to the Orthopædic Hospital, Consulting Surgeon to the State Hospital for Women and Infants.

ELECTED

1864. Granger, William H., M.D.

1857. Green, Alfred, M.D.

1870. Grier, M. J., M.D.

1821. Griffiths, Elijah, M.D.

1842. Griscom, John D., M.D.

1857. Gross, Samuel D., M.D., LL.D., D.C.L. Oxon., Professor of the Principles and Practice of Surgery in the Jefferson Medical College, Consulting Surgeon to the Orthopædic Hospital.

1868. Gross, Samuel W., M.D., Surgeon to the Philadelphia Hospital, Consulting Surgeon to the Northern Dispensary.

1871. Grove, John H., M.D., Surgeon to St. Mary's Hospital.

1863. Hall, A. Douglass, M.D., Surgeon to Wills Hospital, Ophthalmic Surgeon to St. Mary's Hospital.

1865. Hamilton, George, M.D.

*1859. Hammond, William A., M.D.

1869. Hare, H. B., M.D., Physician to the Episcopal Hospital, Pathological Chemist to the Pennsylvania Hospital.

1865. Harlan, George C., M.D., Surgeon to Wills Hospital, Ophthalmic and Aural Surgeon to the Children's Hospital.

1863. Harlow, Lewis D., M.D.

1862. Harris, Robert P., M.D., Physician to the Franklin Reformatory Home.

1847. Hartshorne, Edward, M.D.

*1851. Hartshorne, Henry, M.D.

1868. Hassler, Ferdinand A., M.D.

*1849. Hastings, John, M.D.

1855. Hatfield, Nathan L., M.D., Consulting Physician to the Northern Dispensary.

*1865. Hayes, Isaac I., M.D.

1835. Hays, Isaac, M.D.

1872. Hays, I. Minis, M.D.

1853. Hewson, Addinell, M.D., Surgeon to the Pennsylvania Hospital.

ELECTED

1872. Hinkle, A. G. B., M.D.

1863. Hodge, H. Lenox, M.D., Demonstrator of Anatomy in the University of Pennsylvania, Surgeon to the Presbyterian Hospital and to the Children's Hospital, Consulting Physician to the Lying-in Department of the Northern Dispensary, Consulting Surgeon to the Hospital for relief of Diseases of the Rectum and Urinary Organs.

1852. Hooper, William H., M.D.

1867. Horn, George H., M.D.

1868. Howell, Samuel B., M.D., Professor of Mineralogy and Geology in the University of Pennsylvania.

1854. Hunt, William, M.D., Surgeon to the Pennsylvania Hospital, Consulting Surgeon to the Orthopædic Hospital.

1871. Hunter, Charles T., M.D., Demonstrator of Surgery in the University of Pennsylvania, Surgeon for Out-patients to the Pennsylvania Hospital.

1863. Hutchinson, James H., M.D., Physician to the Pennsylvania Hospital and to the Children's Hospital.

1871. Ingham, James V., M.D., Obstetrician to the State Hospital for Women and Infants.

1871. Jenks, William F., M.D., Surgeon to the State Hospital for Women and Infants, Consulting Physician to the Lying-in Department of the Northern Dispensary.

1864. Jones, S. P., M.D., Assistant Physician to the Pennsylvania Hospital for the Insane.

1867. Judson, Oliver A., M.D.

1849. Keating, William V., M.D., Physician to St. Joseph's Hospital.

1867. Keen, William W., M.D., Lecturer on Pathological Anatomy in the Jefferson Medical College, Surgeon to St. Mary's Hospital.

1852. Kennedy, Alfred L., M.D.

*1844. King, Charles R., M.D.

1864. King, William M., M.D., U. S. N.

1875. Kirkbride, J. J., M.D., Physician for Out-patients to the Pennsylvania Hospital.

ELECTED

1839. Kirkbride, Thomas S., M.D., Physician-in-Chief to the Pennsylvania Hospital for the Insane.

1848. Klapp, Joseph, M.D., Physician to the Howard Hospital.

*1865. LaRoche, C. Percy, M.D.

1868. Leavitt, Thaddeus L., M.D., Physician to the Germantown Hospital.

1864. LeConte, John L., M.D.

1864. Leedom, John M., M.D.

1851. Leidy, Joseph, M.D., LL.D., Professor of Anatomy in the University of Pennsylvania.

1855. Lewis, Francis W., M.D.

1849. Lewis, Samuel, M.D.

1836. Littell, S., M.D., Consulting Surgeon to the Philadelphia Dispensary, Emeritus Surgeon to Wills Hospital.

*1847. Logan, J. Dickinson, M.D.

1849. Ludlow, John L., M.D., Physician to the Philadelphia Hospital and to the Presbyterian Hospital.

1875. McClellan, George, M.D.

1871. McFerran, J. A., M.D., Physician to the Gynæcological Hospital and Infirmary for Diseases of Children.

1866. Maury, F. F., M.D., Lecturer on Venereal and Cutaneous Diseases in the Jefferson Medical College, Surgeon to the Philadelphia Hospital, Consulting Surgeon to the State Hospital for Women and Infants.

*1850. Mayer, Edward H., M.D.

1868. Mears, J. Ewing, M.D., Demonstrator of Surgery in the Jefferson Medical College, Surgeon to St. Mary's Hospital.

1875. Meigs, Arthur V., M.D., Assistant Physician to the Children's Hospital, Examining Physician to the Hospital of the Good Shepherd, Radnor.

1856. Meigs, James Aitken, M.D., Professor of the Institutes of Medicine and of Medical Jurisprudence in the Jefferson Medical College, Physician to the Pennsylvania Hospital.

1843. Meigs, John Forsyth, M.D., Physician to the Pennsylvania Hospital, Consulting Physician to the Children's Hospital.

ELECTED

1856. Mitchell, S. Weir, M.D., Physician to the Orthopædic Hospital and Infirmary for Nervous Diseases, Consulting Physician to the State Hospital for Women and Infants.

1842. Moehring, Gotthilf, M.D.

1863. Morehouse, George R., M.D., Physician to St. Joseph's Hospital.

1839. Morris, Caspar, M.D.

1856. Morris, J. Cheston, M.D.

1861. Morton, Thomas G., M.D., Surgeon to the Pennsylvania Hospital, to the Orthopædic Hospital, and to the Jewish Hospital, Emeritus Surgeon to Wills Hospital.

1864. Moss, William, M.D.

1865. Nebinger, Andrew, M.D.

1846. Neill, John, M.D., Professor of Clinical Surgery in the University of Pennsylvania.

1869. Norris, Herbert, M.D., Physician to the Episcopal Hospital and to the Catharine Street Dispensary.

1865. Norris, Isaac, Jr., M.D.

1870. Norris, John C., M.D.

1866. Norris, William F., M.D., Clinical Professor of Diseases of the Eye in the Hospital of the University of Pennsylvania, Surgeon to Wills Hospital.

1858. Packard, John H., M.D., Surgeon to the Episcopal Hospital.

1863. Page, Edward A., M.D., Surgeon to St. Joseph's Hospital.

1843. Page, William Byrd, M.D.

1835. Pancoast, Joseph, M.D., Emeritus Professor of General, Descriptive, and Surgical Anatomy in the Jefferson Medical College.

1864. Pancoast, William H., M.D., Professor of General, Descriptive, and Surgical Anatomy in the Jefferson Medical College, Surgeon to the Philadelphia Hospital, Consulting Surgeon to the Charity Hospital.

ELECTED

*1854. Parrish, Joseph, M.D.

*1835. Paul, John Marshall, M.D.

1836. Paul, John Rodman, M.D.

1839. Peace, Edward, M.D.

1854. Penrose, R. A. F., M.D., LL.D., Professor of Obstetrics and Diseases of Women and Children in the University of Pennsylvania, Consulting Obstetrician to the State Hospital for Women and Infants, Visiting Physician to the Preston Retreat.

1868. Pepper, William, M.D., Professor of Clinical Medicine in the University of Pennsylvania, Physician to the Philadelphia Hospital and to the Children's Hospital.

1872. Porter, William G., M.D., Surgeon to the Presbyterian Hospital and to the Philadelphia Hospital.

1853. Rand, B. Howard, M.D., Professor of Chemistry in the Jefferson Medical College.

1868. Ray, Isaac, M.D.

1866. Reed, Thomas B., M.D., Surgeon to the Presbyterian Hospital, Microscopist to the Philadelphia Hospital.

1849. Reed, Thomas S., M.D.

1842. Reese, John J., M.D., Professor of Medical Jurisprudence in the University of Pennsylvania, Physician to St. Joseph's Hospital, and to the Gynæcological Hospital and Infirmary for Diseases of Children.

1853. Rhoads, James E., M.D.

1871. Richardson, Elliott, M.D., Surgeon for Out-patients to the Pennsylvania Hospital, Obstetric Physician to the Philadelphia Dispensary, Physician to the Catharine Street Dispensary.

1869. Richardson, Joseph G., M.D., Physician to the Presbyterian Hospital, Physician for Out-patients and Microscopist to the Pennsylvania Hospital.

*1857. Richardson, Thomas G., M.D.

1867. Roberts, Jacob, M.D.

1843. Rodman, Lewis, M.D., Visiting Physician to the Preston Retreat.

ELECTED

1857. Rogers, Robert E., M.D., Professor of Chemistry in the University of Pennsylvania.

1838. Ruschenberger, W. S. W., M.D., U. S. N.

*1852. Sargent, Fitz William, M.D.

1864. Sargent, Winthrop, M.D.

1866. Schaffer, Charles, M.D.

1870. Schell, Henry S., M.D., Ophthalmic and Aural Surgeon to St. Mary's Hospital.

1875. Seyfert, Theodore F., M.D., Physician to the Gynæcological Hospital and Infirmary for Diseases of Children.

1868. Shapleigh, E. B., M.D.

1870. Silliman, Henry R., M.D.

1873. Simpson, James, M.D.

1872. Sinkler, Wharton, M.D., Physician to the Episcopal Hospital, and to the Orthopædic Hospital and Infirmary for Nervous Diseases.

1857. Slocum, Alfred M., M.D.

1863. Smith, Albert H., M.D., Physician to and Lecturer on Obstetrics in the Philadelphia Lying-in Charity, Visiting Physician to the Preston Retreat, Consulting Physician to the Hospital of the Good Shepherd, Radnor.

1863. Smith, A. K., M.D., U. S. A.

1864. Smith, Edward A., M.D.

1845. Smith, F. G., Jr., M.D., Professor of the Institutes of Medicine in the University of Pennsylvania.

*1856. Smith, R. K., M.D.

1870. Smyth, Francis G., M.D.

1864. Spooner, Edward A., M.D.

1875. Starr, Louis, M.D., Assistant Physician to the Episcopal Hospital and to the Children's Hospital.

1835. Stewardson, Thomas, M.D.

1842. Stillé, Alfred, M.D., LL.D., Professor of the Theory and Practice of Medicine in the University of Pennsylvania, Physician to St. Joseph's Hospital, Consulting Physician to the State Hospital for Women and Infants.

ELECTED

1846. Stocker, Anthony E., M.D.

1871. Strawbridge, George, M.D., Clinical Professor of Diseases of the Ear in the Hospital of the University of Pennsylvania, Surgeon to Wills Hospital, Ophthalmic Surgeon to the Presbyterian Hospital, Surgeon to the Eye and Ear Department of the Philadelphia Dispensary.

1855. Stroud, William D., M.D.

1867. Taylor, R. R., M.D.

1867. Thomas, Charles H., M.D.

1873. Thomas, Richard, M.D.

1869. Thomson, William, M.D., Lecturer on Ophthalmic and Aural Surgery in the Jefferson Medical College, Surgeon to Wills Hospital.

1852. Tiedemann, Henry, M.D.

*1853. Tilden, W. P., M.D.

1870. Townsend, Ralph M., M.D., Lecturer on Minor Surgery in the Jefferson Medical College.

1850. Townsend, Richard H., M.D.

1870. Turner, A. Paul, M.D., Physician to the Howard Hospital.

1866. Tyson, James, M.D., Professor of General Pathology and Morbid Anatomy in the University of Pennsylvania, Physician to the Philadelphia Hospital.

*1852. Tyson, James L., M.D.

1864. Vandyke, E. B., M.D.

1873. Van Harlingen, Arthur, M.D., Assistant Physician to the Dispensary for Skin Diseases.

1852. Wallace, Ellerslie, M.D., Professor of Obstetrics and Diseases of Women and Children in the Jefferson Medical College, Consulting Obstetrician to the State Hospital for Women and Infants, Visiting Physician to the Preston Retreat, Consulting Physician to the Lying-in Department of the Northern Dispensary.

1873. Wallace, W. H., M.D.

*1839. Warrington, Joseph, M.D.

1875. Webb, William H., M.D.

ELECTED

1863. Wells, W. Lehman, M.D.

1864. West, Hilborne, M.D., Physician to the Children's Hospital.

1868. Williams, Horace, M.D., Obstetrician to the State Hospital for Women and Infants, Obstetric Physician to the Philadelphia Dispensary, Physician to the Howard Hospital.

1851. Wilson, Ellwood, M.D., Consulting Physician to the Philadelphia Lying-in Charity, Visiting Physician to the Preston Retreat.

1874. Wilson, J. C., M.D., Physician to the Philadelphia Hospital, Physician for Out-patients to the Pennsylvania Hospital.

1871. Wistar, Thomas, M.D.

1848. Wister, Caspar, M.D., Consulting Physician to the Philadelphia Dispensary.

1852. Wister, Owen Jones, M.D.

1827. Wood, George B., M.D., LL.D., Emeritus Professor of the Theory and Practice of Medicine in the University of Pennsylvania.

1865. Wood, Horatio C., Jr., M.D., Professor of Materia Medica and Pharmacy, and of Botany, in the University of Pennsylvania, and Clinical Professor of Diseases of the Nervous System in the Hospital of the same, Physician to the Philadelphia Hospital.

1866. Woods, D. F., M.D., Physician to the Presbyterian Hospital.

1860. Wurts, Charles Stewart, M.D.

1861. Yarrow, Thomas J., M.D., Physician to St. Mary's Hospital.

*1840. Zantzinger, William S., M.D.

[It is particularly requested that any change of Appointment, etc., may be communicated to the Committee of Publication before the first of July, in each year, in order that the List may be made as correct as possible.]

ASSOCIATES.

[Limited to Fifty, of whom Twenty may be Foreigners.]

ELECTED

1873. Acland, Henry W., M.D., F.R.S., Oxford, England.

1869. Alvarenga, P. F. Da Costa, Lisbon, Portugal.

1847. Atlee, John L., M.D., Lancaster, Pennsylvania.

1876. Baldwin, W. O., M.D., Montgomery, Alabama.

1876. Barker, Fordyce, M.D., New York.

1876. Bigelow, Henry J., M.D., Boston, Massachusetts.

1821. Bigelow, Jacob, M.D., Boston, Massachusetts.

1876. Billings, John S., M.D., Washington, District of Columbia.

1876. Bowditch, Henry I., M.D., Boston, Massachusetts.

1865. Butcher, R. G. H., M.D., Dublin, Ireland.

1848. Christison, Sir Robert, Bart., M.D., D.C.L., LL.D., Edinburgh, Scotland.

1853. Churchill, Fleetwood, M.D., Dublin, Ireland.

1876. Clark, Alonzo, M.D., New York.

1876. Comegys, C. G., M.D., Cincinnati, Ohio.

1876. Corson, Hiram, M.D., Norristown, Pennsylvania.

1876. Davis, N. S., M.D., Chicago, Illinois.

1876. Donaldson, F., M.D., Baltimore, Maryland.

1868. Flint, Austin, M.D., New York.

1857. Gintrac, E., Bordeaux, France.

ELECTED

1876. Green, Traill, M.D., Easton, Pennsylvania.
1852. Hall, Archibald, M.D., Canada.
1868. Hamilton, Frank H., M.D., LL.D., New York.
1876. Hodgen, John T., M.D., St. Louis, Missouri.
1876. Jackson, J. B. S., M.D., Boston, Massachusetts.
1874. Jackson, J. Hughlings, M.D., London, England.
1876. Johnson, George, M.D., F.R.S., London, England.
1876. Johnston, Christopher, M.D., Baltimore, Maryland.
1876. Jones, Joseph, M.D., New Orleans, Louisiana.
1876. Kinloch, R. A., M.D., Charleston, South Carolina.
1876. King, James, M.D., Pittsburgh, Pennsylvania.
1854. Lever, John M., M.D., London, England.
1865. Macleod, G. H. B., M.D., Edinburgh, Scotland.
1876. Moore, E. M., M.D., Rochester, New York.
1876. Mowry, R. B., M.D., Alleghany City, Pennsylvania.
1873. Ogle, John W., M.D., London, England.
1874. Paget, Sir James, Bart., D.C.L., LL.D., F.R.S., London, England.
1842. Parker, Peter, M.D., China.
1876. Parker, Willard, M.D., New York.
1873. Peacock, Thomas B., M.D., London, England.
1876. Pollock, A. M., M.D., Pittsburgh, Pennsylvania.
1876. Porcher, F. Peyre, M.D., Charleston, South Carolina.
1842. Smith, Nathan R., M.D., Baltimore, Maryland.
1869. Valcourt, Th. de, Cannes, France.
1857. Valery, Gaetano, Florence, Italy.
1861. Velasco, Pedro Gonzales, Madrid, Spain.
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NOTICE.

The present volume of Transactions contains the papers read before the College from October, 1875, to July, 1876, inclusive.

The Committee of Publication thinks it proper to say that the College holds itself in no way responsible for the statements, reasonings, or opinions set forth in the various papers published in its Transactions.

MEMOIR OF DR. GEORGE W. NORRIS.

At a Special Meeting of the College of Physicians of Philadelphia, held Saturday, March 6, 1875, to take action upon the death of its Vice-President, Dr. George W. Norris, the following resolutions were unanimously adopted:—

Resolved, That the Fellows of the College of Physicians have, with sincere sorrow and unusual emotion, heard of the death of Dr. George W. Norris, the Vice-President of the College, which occurred on March 4, after a long and painful illness.

Resolved, That, while submitting with reverence to the decree of Providence, depriving them of one of their most esteemed associates, they cherish the consolation that regret for the loss sustained in his decease is accompanied by imperishable recollections of his personal worth.

Resolved, That the Fellows of the College have been deeply impressed by the courteous and gentle bearing of their late Vice-President, by his honorable conduct and high tone in his relations with his associates, by his studious avoidance of everything incompatible with the dignity of the profession of medicine, and by his entire freedom from all invidious personal assertion, while fully appreciative of the obligations of duty.

Resolved, That they regard his life and professional career as models worthy of imitation, and as eminently illustrative of the principles which have animated the conduct of the great and the good men of our profession.

Resolved, That his memory will be ever venerated for his whole-souled devotion to the interests of the profession, for his faithful maintenance of them, and for his life-long endeavor to promote the advancement and efficiency of that profession by his personal contributions.

Resolved, That the Secretary be instructed to transmit a copy of these resolutions to the family of Dr. Norris, and that they be published in the medical periodicals of this city.

At a Stated Meeting of the College of Physicians of Philadelphia, held May 5, 1875, Dr. William Hunt was appointed to prepare a memoir of the late Vice-President of the College, Dr. George W. Norris.

MEMOIR

OF

GEORGE W. NORRIS, M.D.,

LATE VICE-PRESIDENT OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA, FORMERLY SURGEON TO THE PENNSYLVANIA HOSPITAL, MEMBER OF THE SOCIÉTÉ MÉDICALE D'OBSERVATION OF PARIS, ETC.

By

WILLIAM HUNT, M.D.

[Read October 6, 1875.]

In a memorandum left by our late Vice-president for his son, Dr. Norris wrote: "Your ancestry, as far as I have been able to trace them, were industrious and well educated, possessed generous feelings, occupied honorable positions in society, were respected by the good, and have left a name which, I trust, their descendants will take care to keep bright."

The Norris family[1] originally came from the Isle of Wight. Thomas Norris, the earliest of whom any accounts are preserved, was a London merchant in 1650, and appears to have been a person of position. He joined the Quakers soon after their origin, was persecuted for opinion's sake, and was one of the five who sent an earnest letter to Cromwell offering to take the place of certain Friends who were imprisoned on account of their religion. This letter brought from Cromwell the question to the members of his council, asking

[1] For these incidents of family history I am indebted to Dr. Norris's brother, Isaac Norris, Esq.

which of them would make a like offer on his behalf, if it were his misfortune to be imprisoned at any time. The new convert was at length driven from his country by religious persecutions, and settled in the Island of Jamaica, to which many Friends had emigrated. Here he and all of his large family, with one exception, perished in the memorable earthquake which destroyed Port Royal in 1692; this exception being his son Isaac, who happened to be absent on a visit to Pennsylvania.

Isaac Norris abandoned Port Royal and removed to Philadelphia. Here he married a daughter of Thomas Lloyd, who was the first deputy governor of the province under the proprietor, William Penn. This alliance brought him into notice in his adopted town, and also secured for him the friendship of the founder of Pennsylvania. He soon embarked in mercantile life, trading at first with the West Indies, and then with England, and for these purposes built vessels which were among the first constructed at Philadelphia. He was successful, and rapidly laid the foundation of a fortune to replace that which his family had lost in Jamaica. In the pursuance of business he visited Great Britain, and was in England at the time of the memorable imprisonment of Wm. Penn, for debt, in the Fleet, where he frequently visited his old friend, and, doubtless, was a great comfort to him in his sore distress. Isaac Norris returned to Philadelphia after an absence of two years, the most of which had been spent in the study of commerce, and of the methods of conducting it in the mother country. The knowledge thus gained was turned to good account, and indicated qualities of no mean ability, for much sound judgment was needed in adapting the wants of the colonies,

which then had so little to give, to a system of exchanges with England which had so much to send.

Mr. Norris bought from Wm. Trent the celebrated "Slate Roof House," in Second Street below Chestnut, and resided there for many years. He afterwards removed to Fair Hill, where he built a large country house in which he resided until his death. This house was burned by the British after the battle of Germantown, under the belief that it belonged to the rebel John Dickinson, who then occupied it. It was afterwards rebuilt, and is still standing, and was owned by Dr. Norris at the time of his death. Mr. Norris also united with Wm. Trent and purchased from the Penn family the manor of Williamstadt, containing about seven thousand acres, in what is now Montgomery County, in this State. He soon purchased Trent's interest and became the sole owner. The name was changed, and now forms the township of Norriton, and contains within its limits Norristown the county seat.

Isaac Norris took a prominent part in the Colonial Assembly and Council, and advocated whatever was thought necessary to advance the interest and welfare of the province. He was appointed one of the Judges of the Court of Common Pleas. He was an active member and elder in the religious society of Friends, and his influence as a leader may be imagined, when it is remembered that the Friends, in those early days of Pennsylvania, controlled every measure, whether its character was civil, political, or religious. Mr. Norris died in 1735, and was succeeded by his son of the same name, who had been brought up as a merchant. The son, however, had no taste for trade, and soon abandoned it. He became a member of the Colonial Assembly, and was chosen its speaker, which influential position he held for

over a quarter of a century. He married a daughter of James Logan, the Colonial Secretary and agent of the Penn family. He became the owner of Fair Hill, and resided there during his life, and devoted much time to literature. He had but two children, both daughters; one died early, and the other married John Dickinson, the author of the "Farmer's letters," who also took a very active and leading part in the war of the revolution.

The direct descent of Dr. Norris is through another son of Isaac, Charles Norris. He married Mary Parker, the only child of Joseph Parker, of Chester. He built the Chestnut Street House, which is charmingly described by his daughter, Deborah Logan. It stood on the site of the present Custom House. His son, Joseph Parker Norris, married Elizabeth Hill Fox, and in the Chestnut Street House, on the 6th of November, 1808, their sixth son, George Washington Norris, the subject of this memoir, was born.

George W. Norris went to school to James Ross, a popular teacher and school book author of the time. After this he entered the Academical Department of the University of Pennsylvania, and took his degree of Bachelor of Arts on the 26th of July, 1827. He was an exceedingly popular member of his class. He soon determined to study medicine, and chose Dr. Joseph Parrish for his preceptor. The doctor was one of the most beloved and busiest practitioners of the day, and spared no pains to forward the practical education of his pupils. He instituted private courses for them, and his connection as surgeon with the Pennsylvania Hospital and other institutions gave them many advantages. One of his most fortunate selections as a tutor of his students was that of our venerable president, Dr. Geo. B. Wood, the

sound impress of whose character and teachings is indelibly stamped upon generations of pupils. At the University, also, there were men of remarkable influence and ability, most of whom must have been in their prime. Among these were Physick, Chapman, Hare, Gibson, Horner, and Jackson, acting either as professors or adjuncts. Physick was in his decline as a teacher, and gave but partial courses, but his genius and reputation had, doubtless, a controlling influence in directing the studies of Dr. Norris especially to surgery.

Dr. Norris took his medical degree in the spring of 1830, his inaugural thesis being upon "Varioloid and Vaccine Diseases." His attention was drawn to this subject by the prevalence of an epidemic of variola. Many members of the medical class, together with himself, were attacked by the disease, and about the same time, through it, he lost one of his brothers. In the same year that he graduated he was appointed one of the resident physicians to the Pennsylvania Hospital, and served the institution in this capacity for three years. But one of the professional staff of that day is now living. In it we find names that are by no means pent up in the narrow limits of local medical history. The physicians were Drs. Otto, J. K. Mitchell, and B. H. Coates; the surgeons Drs. Hewson, Barton, and Harris; the obstetricians Drs. James, Hodge, and Lukens.

Dr. Norris was, as a resident physician, faithful in every particular. The system of rotation into the various departments was pursued then as now; and while doing full duty in all of them, with the intent of becoming a good physician as well as a good surgeon, he manifested a decided inclination for surgery.

Dr. Carson tells us that he was severely tested by an

epidemic of puerperal fever which occurred in 1831, and that his conduct on this occasion won meritorious notice. His term of service expired in the spring of 1833, and on the 24th of April of that year he sailed for Europe. He took lodgings with a French family in Paris, in order to familiarize himself with the language. Here, also, he pursued his professional studies with industry, and again had the advantage of instruction and intercourse with the great lights of the day, men whom it almost seems are as familiar to us now as they were to those who witnessed their deeds.

Dupuytren, Velpeau, and Roux, were the chief surgeons. The former was failing. In this very year he had an attack of apoplexy, and retired for a while to rest from his labors, but afterwards returned undaunted, and for another year continued his work. Magendie was at his height in physiological experiment. It does not appear that Dr. Norris spent much time in England in medical study, though he there met Sir Astley Cooper who was still the leader. During his stay in Paris the doctor was made a member of the "Société Médicale d'Observation," of which Louis was president. He was also a favorite of Velpeau, and, by translations from the English, assisted him in a successful *concours* for one of the chairs of clinical surgery in 1834.

In October, 1835, Dr. Norris returned to Philadelphia, and entered upon the practice of his profession. In 1836, he was elected one of the surgeons to the Pennsylvania Hospital, in place of Dr. John Rhea Barton, resigned. His surgical colleagues at this time were Drs. Jacob Randolph and Thomas Harris, the latter of whom gave place to Dr. Edward Peace, in 1840, and the former to Dr. George Fox, in 1848. Dr. Norris's other associates on the staff, in the order of time, were Drs. John Neill, Joseph Pancoast, Edward

Hartshorne, and Addinell Hewson. On the 28th of September, 1863, he resigned after having served the institution for twenty-seven years, a longer period than that of any other surgeon heretofore connected with the hospital. About 1846 a chair of clinical surgery was established in the University of Pennsylvania, attendance upon a course of hospital instruction having been made one of the requisites for graduation. The senior surgeons of the Pennsylvania Hospital filled this position, and performed its duties in that institution. Dr. Randolph was the incumbent for a short time, and, upon his death, Dr. Norris succeeded to the professorship, and occupied it until 1857, when, having been elected a Trustee of the University, he resigned.

Dr. Norris was twenty-eight years old at the time of his election to the hospital. He entered upon his duties with characteristic earnestness, and, from our knowledge of him in after life, we can readily imagine him to have been rather depressed with a sense of responsibility than rejoicing in his elevation. He was very punctual in attendance, and systematic in method. Careful himself in every particular, nothing so disturbed him as real or apparent neglect on the part of his subordinates. His reproofs on these occasions were very effective, but more by manner and a few low spoken words than by any vociferous outbreak. At his visits every patient was required to be in place, and there was a kind word for every one. New cases were carefully investigated, and the most trivial were not allowed to pass without attention. Nothing escaped him in regard to the condition of the wards as to ventilation and cleanliness. Any nurse not meeting his requirements in the latter particular incurred his displeasure, which was sure to bring

about either improvement or dismissal. With him cleanliness was a passion. We have often seen him performing offices about those wounds and fractures which he preferred himself to handle, that, under other circumstances, might have been considered derogatory. A true disciple of his calling, he hesitated not to wash the feet of the humblest pleader for his healing ministrations. In fact, one of the criticisms that we have heard made as to his treatment is, that he was over-nice and disturbed things too often; but the handling was done by one who knew how to do it, and we never knew it done to the detriment of the patient.

Truly, now, the question "what is dirt?" is one for the schoolmen to settle, since we have those who advocate bulky dressings and crude materials, and those who believe in lightness amounting almost to nothing. We have those who dress every day, and those who dress once a week. We have those who wash, and those who do not wash. He who fears all sorts of pestilential spores from without, closes his wounds tightly and forgets that he stops but one hole, and that the attack may take place from within, while he who believes the patient himself is mostly the source of his own contaminations, gives full play to the diluting influence of external surroundings. Dr. Norris troubled himself but little about these theories. He thought he knew what dirt was, and whether it came from within or without, it was something to be got rid of. Those of us who served under him know well that it was the exception to make a ward visit without hearing the call for "more soap and water."

Whatever may be the opinions now as to the disturbing effects of the frequent examinations and dressings of injuries, one thing is certain, that, under the administration of Dr. Norris, and, greatly through his influence, under that of

his colleagues, the plan was remarkably successful. As to fractures, for example, he tells us that for twenty years, *i. e.*, from 1830 to 1850, twenty-one hundred and ninety-five cases of recent fracture were admitted into the Pennsylvania Hospital, and in no one instance did false joint follow the treatment. The cases treated for false joint were all admitted as such. We doubt whether the reputation of the old house is quite as well sustained to this day, but we can say that the old influences as to frequent examinations still prevail. New methods have, in many cases, obtained footing with satisfactory results; but the one cardinal rule, "watch," is insisted on by all in authority. A false inference might be drawn from our use of the word disturbance. The handling, being done, as we said, by those who know how to do it, really implies little or no movement of the important parts. The ideas of Dr. Norris might be better expressed thus: that, in the treatment of fractures, he insisted upon some form of dressing, which, while fulfilling all the indications, at the same time allowed of the inspection of the injured parts at a moment's notice, and with as little disturbance as possible.

As an illustration take Barton's bran dressing in compound fractures. Its capabilities for good are almost endless. With it we can sustain with the slightest pressure, or press with the greatest force. It absorbs the discharges which may easily be removed. We may mix it with antiseptics to the utter destruction of odors and germs. We may extract fragments of bone or sloughs, tie vessels, and open abscesses, while the limb is lying on a bed of it in the box, and all we need is a spatula to remove the old soaked material which has so nicely taken up the blood and pus and water, and a fresh supply to replace that which is spoiled. Thus we may

examine, adjust, re-examine, and re-adjust, and wash, and dress, and purify, to our heart's content, and, not excepting the operative part of the proceedings, we do it all with a minimum of disturbance.

It may well be imagined that such a dressing as this met the requirements of Dr. Norris, who did much to develop its usefulness. In simple fractures of the lower extremities his favorite apparatus was the fracture-box, the days of which are considered by some as past; it still holds its place with most of us at the Pennsylvania Hospital, and the probabilities are that it will long continue to do so. Those who imagine that all that is done with it is to put the limb on a pillow and shut it up, have a very limited idea of the fracture-box's capabilities, and some cause for condemning it. What Dr. Norris did with it was marvellous. In his hands, as it should be in those of all who use it, it was the mere skeleton for infinite aptitudes. These examples are sufficient to indicate the doctor's method in what some may consider the minor departments of surgery. They unquestionably held the first place in his estimation.

If, after diagnosis, there was a chance for salvation without operation, that chance was given. It is easy to say when you *must* operate; as easy, probably, to say when you must not; but what surgeon of experience does not recognize the difficulties in deciding upon a course as to those border-line cases which so frequently occur, especially in accident surgery? Sacrifice under these circumstances is too often characterized as brilliancy, while attempts at salvation, through thought and labor compared to which the first course is but a trifle, may end simply in a something that is better than nothing, and in reproaches rather than thanks. All or none, however, was no motto

for Dr. Norris. He carefully considered a case in every aspect, and only took up the knife as a last resort.

As an operator he was very methodical. Every possible detail was carefully considered beforehand, and every contingency was provided against. He looked over all that was prepared by his subordinates, and although everything of absolute necessity might be upon the tray, it was rarely that his extra caution did not suggest something that might possibly be called into service. This caution, by no means, however, implied (especially upon clinic days) the overloading of the tray with glittering steel. Nothing was done for sensation, all for use. In operating, earnestness marked every feature, and characterized every movement. We have seen him in great cases, and at critical points, when the mental strain must have been intense, so wholly did he throw himself into his work, but we are not aware of any failure to accomplish his object, nor of any of the deplorable accidents of the operating table having happened to him—a result to be attributed, first to his selection of cases, and secondly to his careful preparation. Where he could not select, but had to act promptly, he was equal to the occasion, and, of course, had his own measure of successes and failures. He regarded the after-treatment of operative cases as the most important element of success. His plans were simple, but carried out with every attention to detail; hemorrhage, especially of the secondary variety, was his dread, as it should be that of every surgeon. Every precaution was taken against it, and, until convalescence was fully established, the patient was kept under guard.

Dr. Norris was a plain and concise lecturer. He gave the pith of the matter, and made no attempt whatever

at show. His voice was low, but well modulated, and the respect and attention which his appearance always commanded, made it also easy to hear him. He was tall and imposing in figure, and graceful in his movements. A partial baldness, and at the same time a long dark beard, gave him early an appearance of age far beyond his years. His eyes were of a bluish gray; his complexion was uniform, inclining to paleness; altogether, his countenance was decidedly intellectual, having great dignity of expression, and breaking upon occasion into a smile of extraordinary sweetness.

His lectures were essentially practical. He liked those cases and subjects which he knew would be of the most use to his hearers in the future. He never operated or sought an operation for its own sake, or for that of the arena. He operated publicly, in the line of his duty, and always sought to make both the operation and the lesson good ones. He would give a brief account of the case beforehand, and reserve his comments until the operation was over. Rarely, until all was done, would there be a word, even of explanation. With him the Ego was at a discount, the patient was everything. Perhaps he carried this style to an extreme; if so, we have to say of it, that in the old times, it was an extreme on the side of humanity, and in these days of anæsthesia, it is an extreme on the side of safety.

We have thus tried to picture Dr. Norris as a hospital surgeon. In private practice, the same qualities of firmness, combined with gentleness and patience, with care, were manifest. His opinions were much sought and valued by his fellows.

If not indifferent, he was modest and even careless as to recompense. The pecuniary returns from his practice were never in proportion to his services. To be sure, for the most of his life, having other resources, he was independent; but we must say, that in this matter, he never did himself justice. Such was his simplicity of character in this respect, that we doubt whether even dire necessity could have made him pursue his profession with success as a business. This trait of his character was further illustrated in the fact that nothing could make him believe the accounts he would sometimes hear of large professional incomes; and in this disbelief, the writer is confident, there was no affectation.

We now come to speak of Dr. Norris as an author. His first paper, that we can find, appeared in the *American Journal of the Medical Sciences*, vol. xx. 1837. It is an account of "Fracture and Dislocation of the Astragalus." From this time, there appeared, at varying intervals, through about thirty years, and mostly in the same journal, essays, statistical papers, and details of cases, amounting to twenty or more in number.

There is not one of these papers that did not make its mark. Most of them have been collected, and form a volume entitled "Contributions to Practical Surgery," the one book of the author, published during his life. And truly contributions they are. His invaluable statistical papers at once made the author famous, and, as Dr. Ashhurst says in his review, "are quoted in all parts of the civilized world, where the English language is either read or spoken." The essay upon "The Occurrence of Non-union after Fractures," is an exhaustive masterpiece.

Professor Hamilton says of it, that it is "the most complete and reliable monograph upon this subject contained in any language." The style of the articles is plain, without even the slightest attempt at ornamentation. Nothing that intelligent labor could find to bear upon the various themes, has been left out, and the results of this labor are combined with the author's own great experience. At the close of the important essays, there is a concise summary of facts and conclusions. Lacking other matter to speak of, there is scarcely a paper, that one could not take up and make the text of a discourse, but we think, that in a memoir of this kind, it would be out of place to do so. The "Enduring Monument," which the author has constructed, needs not, nor could it acquire, any strengthening support from us.

On the 7th of February, 1838, Dr. Norris married Mary P. Fisher, daughter of the late Wm. W. Fisher. She survives him, together with their two children, Dr. Wm. F. Norris and Mary Fisher Norris, now Mrs. James Parsons.

The Doctor's home life, until overshadowed by sickness, was cast in pleasant places. His time, not occupied professionally, was taken up with public and private duties, with books, of which he was a great lover, and with friends in whom he delighted. His tastes were antiquarian. He took great interest in the early history of his native city. At times he amused himself with a hand press, and printed fifty pages of a book to be entitled "Medicine, and the Early Medical Men of Philadelphia." His son has, we learn, some idea of publishing this work, which those who have had the opportunity to inspect it, speak of as being a volume of the greatest interest and value.

Besides being surgeon to the Pennsylvania Hospital, Dr. Norris filled various offices of honor and trust, in most of which he did active duty. He was Vice-President of the College of Physicians from 1864, when he succeeded Dr. Franklin Bache, to the time of his death. He was President of the Board of Managers of the Children's Hospital, and Consulting Surgeon to the same Institution and to the Orthopædic Hospital. He was a member of the Academy of Natural Sciences, of the American Philosophical Society, and of the Historical Society. The Philadelphia Library, of which he was for many years a director, and, at the time of his death, president, claimed a large share of his interest and attention. He was also a Director of the Mutual Fire Insurance Company (Green Tree), and of the Philadelphia Savings Fund Society, and last, though by no means least, he was a valued and much consulted Trustee of the University of Pennsylvania.

Although a Quaker by birth, Dr. Norris, for a long time, attended the Episcopal Church, and, late in life, became a member of that communion.

For some years before his death Dr. Norris's health was failing. He had chronic pulmonary disease, which a naturally strong constitution enabled him to resist; but when this was supplemented by an attack of prostatic and cystic abscess, which he had in 1872, his health was completely undermined. As an invalid he bore his sufferings with patience and humility, and at times would rally and pursue his usual pleasant avocations. He had, for a long time, given up practice; but, to the last, he never lost interest in his profession. About the first of this year (1875) he was prostrated by an attack of unusual severity, and it was soon apparent to his attendants that it would be fatal. He

nevertheless lived until the 4th of March, when, through exhaustion, he quietly passed away.

We have thus sketched the life of a thorough conservative. We have had no striking or brilliant deeds to describe. It is simply the record of one who did his work honestly and well.

Earnestness was the great feature of Dr. Norris's character, but enthusiasm was wanting to make that earnestness aggressive. Such men cling to the old, while they receive and adopt the new with caution and distrust. It is said they do nothing for advance. We do not agree to this. Their deeds are not written in water, but they are those who contribute lasting blocks to the slowly rising temple of truth.

Dr. Norris was a man of truth. He never flattered and he never sneered. Well may we wish that not only we but many more of his profession than those who hear me this night were such as he was.

LIST OF THE MORE IMPORTANT SURGICAL WORKS AND PAPERS PUBLISHED BY DR. GEORGE W. NORRIS.

[Papers marked thus (*) are reprinted in Dr. Norris's "Contributions to Practical Surgery."]

1837. Case of Dislocation and Fracture of the Astragalus, etc. American Journal of the Medical Sciences, Aug. 1837.*

1838. Statistical Account of the Cases of Amputation performed at the Pennsylvania Hospital from Jan. 1, 1831, to Jan. 1, 1838. Ibid., August, 1838.

Liston's Practical Surgery, with Notes. 8vo. Philadelphia, 1838.

Congenital Club-foot—Division of the Tendo Achillis. American Journal of the Medical Sciences, Nov. 1838.

1839. Report of the Surgical Cases treated at the Pennsylvania Hospital during the months of May, June, July, August, September, and October, 1838. Ibid., February, 1839.

1840. Report of the Surgical Cases treated in the Pennsylvania Hospital during the months of July, August, September, and October, 1839. Ibid., February, 1840.

Statistical Account of the Cases of Amputation performed at the Pennsylvania Hospital from Jan. 1, 1838, to Jan. 1, 1840. Ibid., May, 1840.

1841. Statistics of Fractures and Dislocations treated in the Pennsylvania Hospital during the ten years from 1830 to 1839 inclusive. Ibid., April, 1841.*

1842. On the Occurrence of Non-union after Fractures; its Causes and Treatment. Ibid., January, 1842.*

On the Treatment of Deformities following unsuccessfully treated Fractures. Ibid., October, 1842.*

1843. Report of Surgical Cases treated at the Pennsylvania Hospital. Ibid., January, 1843.

Fergusson's System of Practical Surgery, with Notes. 8vo. Philadelphia, 1843.

1845. ———————— Second Edition. 8vo. Philadelphia, 1845.

Table showing the Mortality following the Operation of

tying the Subclavian Artery. American Journal of the Medical Sciences, July, 1845.*

1847. Table showing the Mortality following the Operation of tying the Iliac Arteries. Ibid., January, 1847.*

Statistics of the Mortality following the operation of tying the Carotid Arteries and Arteria Innominata. Ibid., July, 1847.*

Chelius's System of Surgery, translated by South. [With References to American Surgical Literature.] 8vo., three volumes. Philadelphia, 1847.

1848. Report of the Committee on Surgery to the National Medical Association. Transactions of the American Medical Association. Vol. I., 1848.

1849. Statistics of the Mortality following the Operation of tying the Femoral Artery. American Journal of the Medical Sciences, October, 1849.*

1850. Case of Fibrous Tumor removed from the Ear. Transactions of the College of Physicians (First Series), Vol. III.

1852. Statistics of Fractures and Dislocations treated in the Pennsylvania Hospital during the ten years from 1840 to 1849, inclusive. American Journal of the Medical Sciences, October, 1852.*

1854. Statistical Account of the Cases of Amputation performed at the Pennsylvania Hospital from Jan. 1, 1840, to Jan. 1, 1850. Ibid., July, 1854.

1855. Case of Fracture of the Neck of the Humerus with Dislocation of its Head. Transactions of the College of Physicians (Second Series), Vol. II.

1868. Statistical Account of the Cases of Amputation performed at the Pennsylvania Hospital, from Jan. 1, 1850, to Jan. 1, 1860. Pennsylvania Hospital Reports, Vol. I.*

1873. Contributions to Practical Surgery. 8vo. Philadelphia, 1873.

In addition to the works and papers above enumerated, Dr. Norris contributed a memoir of Dr. Randolph to the Transactions of the College of Physicians (read August 1, 1848), and several reviews and bibliographical notices to the American Journal of the Medical Sciences.

MEMOIR

OF

JOHN S. PARRY, M.D.,

LATE PRESIDENT OF THE OBSTETRICAL SOCIETY OF PHILADELPHIA, OBSTETRICIAN TO THE PHILADELPHIA HOSPITAL, PHYSICIAN TO THE DEPARTMENT FOR THE DISEASES OF WOMEN IN THE PRESBYTERIAN HOSPITAL, ETC.

By

JAMES V. INGHAM, M.D.

[Read July 5, 1876.]

Dr. John S. Parry, the only son of Seneca and Priscilla S. Parry, was born on the 4th of January, 1843, in Drumore Township, Lancaster County, Pennsylvania. When he was six years old his father died, leaving the care of the farm and three young children to the widowed mother. Stimulated by a mother's love, she proved herself equal to the double task, and managed the farm so successfully as to enable her to give to her children all the benefits of the education which the common schools of the neighborhood afforded. Brought up under the religious and moral training of the Society of Friends, to which his parents belonged, Dr. Parry early acquired that earnestness and love of truth and honesty which were so characteristic of him during his entire professional life.

During his childhood he was fond of study, often preferring his books to the society and amusements of his associates, and became so much interested in various experiments

upon the domestic animals, and in the study of natural history, that he early received the playful title of Doctor from his companions.

In his seventeenth year, after a brief period spent at the Gwynedd Boarding School, he entered the office of Dr. J. M. Deaver, of Lancaster County, Pa., and regularly commenced the study of medicine. Three years were passed under Dr. Deaver's instruction, until the autumn of 1863, when Parry came to Philadelphia, and matriculated in the Medical Department of the University of Pennsylvania. In March, 1865, after taking two full courses of lectures at the University, he received his degree of Doctor of Medicine.

Dr. Parry at once applied for and succeeded in obtaining the position of Resident Physician to the Philadelphia Hospital, and in April, three weeks after graduation, entered the hospital for the term of one year. This period was spent in persistent and conscientious study of the cases entrusted to his care, and it was then that he laid the foundation of that skill in diagnosis which afterwards distinguished him both at the bedside and in the lecture-room. While a resident in the obstetrical wards he had the opportunity of studying an epidemic of puerperal fever, and the notes and observations made then, furnished the text for the valuable paper on this subject published some years later. During the latter part of his hospital life he had a severe attack of pleurisy, which, coming at a time when he was run down by close study and hard work, and enfeebled by occasional attacks of intermittent fever, made very serious inroads on his health which he never entirely recovered.

He left the hospital on the last day of March, 1866, and soon afterwards (April 5, 1866) was married to Rachel P., daughter of William P. and Annie G. Sharpless, of this city.

He at once commenced the practice of medicine in Philadelphia, and, obtaining the appointment of district physician to the Philadelphia Dispensary, continued the studies of his hospital life.

In 1867 Dr. Parry received the appointment of Visiting Obstetrician to the Philadelphia Hospital, and at once concentrated his mind upon the study of obstetrics and the diseases of women and children. Soon afterwards he reorganized the obstetrical clinics at this hospital, which had been discontinued for some years, and, in conjunction with his colleague, Dr. E. L. Duer, labored earnestly to utilize for scientific purposes, and to bring before the medical students, some of the vast amount of valuable clinical material always to be found in the obstetrical, gynæcological, and children's wards of this large hospital. In October, 1870, he published his first contribution to the literature of his profession, in a paper entitled "Observations on Relapsing Fever as it occurred in Philadelphia in the winter of 1869–70."

It was Dr. Parry's fortune to have met in his practice among the patients of the Philadelphia Dispensary, several cases of this disease as early as the 10th of September, 1869, and before its existence in the city had been recognized or suspected; and it was the failure to secure relief by large doses of quinine (as high as ʒj in twelve hours) which led him to suspect the existence of this, to him, new form of fever. This paper carefully traced the rise and progress of the disease in Philadelphia, and gave abundant evidence of his power as a medical reporter. In opposition to Murchison, Begbie, Aitken, Flint, and others, Dr. Parry could not find any evidence that the disease was caused by starvation, but was forced to conclude that the "much more potent cause was over-crowding, and the notoriously small breathing space

allotted to each individual in the houses of the poor." Like other observers, however, he was convinced that medicines were unable to prevent the seventh day relapse.

From this time Dr. Parry's pen was never idle. In health and in sickness he wrote the records of his cases with unceasing industry. The wards at Blockley were to him as vast fields of ungarnered grain, and, with a seeming consciousness that his time was limited, he grudged every moment passed away from them. Joining the Pathological Society in 1867, and the College of Physicians and Obstetrical Society in 1870, he soon became known by his active participation in the discussions of these bodies, and by the various papers read, and the cases reported, especially to the Obstetrical Society, in which he took the greatest interest.

His untiring industry and conscientious devotion to his patients now brought to him a rapidly increasing practice, and many of his contemporaries, recognizing his great diagnostic skill, sought him in consultation. Notwithstanding his increasing duties and indifferent health, he still found time to carefully prepare and deliver two clinical lectures a week at the Philadelphia Hospital, and to write in rapid succession many valuable papers and clinical reports, of which a list is appended to this memoir.

Of these papers three attracted especial attention, and would alone have given to Dr. Parry a prominent and permanent position among the medical writers of this country. The first two were the papers on Rachitis. Carefully exhaustive and closely analytical, these papers contributed largely to advance our knowledge of this insidious affection, and were by Dr. R. W. Taylor, of New York, designated as "the best and most comprehensive articles in any language upon the subject." The most important result achieved by

Dr. Parry in this direction was the conclusive proof of the incorrectness of the assertion previously made by all the American writers on diseases of children, that rachitis was much less frequent in this country than in Europe. Taking his statistics from various foreign authors, he found that among the dispensary patients of England and Germany, about fifty per cent. of all children under five years of age were rachitic. Examining then the children in the Philadelphia Hospital, he found that "at least twenty-eight per cent. of all the sick children between the ages of one month and five years," who came under his observation for three years, were rachitic. This estimate he believed to be under rather than above the truth. His dispensary practice convinced him that about the same ratio prevailed in the poorer classes outside of the hospital; and he claimed to have frequently met with well-developed and typical examples of rachitis among "children whose parents were able to provide them with every luxury," and also among "children well cared for and living in the country." He was therefore "irresistibly forced to the conclusion that rachitis is scarcely less frequent in Philadelphia than it is in the large cities of Great Britain and the continent of Europe." The first to take this ground, he had the satisfaction of finding his conclusions sustained by the subsequent clinical experience of himself and others.

The other important paper was the one on Inherited Syphilis, which, though less original in its matter, was extremely valuable for the well-digested clinical facts presented to the reader.

In 1872 Dr. Parry was elected one of the "Physicians for Diseases peculiar to Women," at the Presbyterian Hospital. He gave much of his time to assisting in the organization of

this new charity, and from its wards, when opened, he obtained many instructive cases.

Ever on the alert to improve the condition of suffering humanity, he was one of the first to recognize the great evils connected with the lying-in wards of the Philadelphia Hospital, and to labor for their cure. One of the greatest of these evils was the deteriorating moral influence exerted over young girls, who, having fallen victims to the wiles of the seducer, or to their own uneducated physical natures, were compelled, in the absence of any other refuge for unmarried women, to enter these wards filled with the lowest and most abandoned women of this large city. Impressed with the importance of extending a helping hand to these unfortunates—not yet criminal—he was, in the autumn of 1872, very active in starting the "State Hospital for Women and Infants," presided over the early meetings of the founders of this charity, and afterward accepted the position of Surgeon to the Hospital.

In the spring of 1873 Dr. Parry published a paper on the comparative merits of craniotomy and Cæsarean section in pelves with a conjugate diameter of two and a half inches, in which he carefully arrived at the following conclusions:—

"I. If gestation has advanced to the full term, and the conjugate diameter of the superior strait be two inches and a half, craniotomy affords the mother no better chance for recovery than the Cæsarean section; and if the diameter be two inches or less, exclusive of the soft parts, it is the duty of the accoucheur to perform gastro-hysterotomy rather than craniotomy.

"II. The recorded histories of cephalotripsy in such cases afford us no evidence that it will compete with the Cæsarean

section in safety, while the French and German experience seems to show that cranioclasm is both more safe and more efficient."

While preparing this paper he sought for information in every direction, and especially from Dr. Hugh L. Hodge, who became so much interested that he prepared for the Obstetrical Society of Philadelphia his valuable paper on Compression of the Fœtal Head by the Forceps and Cephalotribe.

Soon after the completion of this paper Dr. Parry had a pulmonary hemorrhage, which compelled him to rest from his labors. In company with his wife he left the city, and passed the months of April and May in Virginia, and returned greatly improved. In the autumn, however, a severe attack of pleuro-pneumonia so enfeebled him that he was compelled to leave the city and pass the winter in Florida, where he slowly convaleseed. Even then, however, although seeking health, he could not be idle, but spent his time, and possibly more of his strength than he could afford, in studying conchology and botany, and in collecting facts concerning the climate, which he thought might be of interest and value to invalids visiting Florida in the future. At one time he had it in contemplation to publish a book on the value of Florida as a sanitary resort, but his failing health did not permit him to realize the desire.

In the spring of 1874 he returned to Philadelphia, apparently in comparatively good health, and resumed his practice and his hospital duties. Soon after, however, a trying case of labor, in which a long and difficult craniotomy operation had to be performed, resulted in a severe hemorrhage from the lungs. This compelled him again to give up, and reluctantly he left the city and passed the summer at Lake

George. On his return, in the autumn, he resumed his work and completed a paper on Puerperal Fever, for which he had been collecting facts ever since his first experience in the hospital as far back as 1865. This again proved too much for his strength, and he was forced to return to Florida, where he passed the winter and where he resumed the studies and occupations of the previous year.

The spring of 1875 brought him back to Philadelphia, greatly benefited, and his friends hoped that the improvement would be permanent. The summer was passed partially in rest, and the autumn found him in comparatively fair health. With buoyant spirits and bright anticipations he resumed the labors which he had so often been compelled to relinquish. For several years he had been collecting material for the publication of a book on Extra-Uterine Pregnancy, and to this almost completed task he devoted his time and energy. At the same time, however, he made many very valuable additions to the second edition of Leishman's Obstetrics; the most notable of these are contained in the chapters on the Forceps and in the new chapter, added by himself, on Diphtheritic Wounds of the Vagina.

The double task proved too much for his strength, and Dr. Parry again succumbed. Although sick and exhausted, he remained in the city in order to complete his work on Extra-Uterine Pregnancy and see it through the press. For this object he labored night and day; and many of the Fellows of the College present to-night will remember seeing him in the library, where, pale, thin, haggard, and racked with cough, he spent hour after hour in hard and exhaustive work. It was not until December that he could be persuaded to leave the city, when he went again to Florida, accompanied this time, as before, by his devoted wife, but in so prostrated a

condition as to leave his friends but little hope for his return alive. These sad forebodings proved, alas, too true; for, although temporarily benefited by the warm climate, he soon sank, and on the 11th of March, 1876, died at Jacksonville, Florida, in the thirty-fourth year of his age. His body was embalmed and brought to this city, and, on March 16, was buried in the cemetery at Laurel Hill.

When Dr. Parry died, the medical profession, not only of Philadelphia, but of the whole country, lost one of its brightest ornaments and most useful workers. Few men of his age have accomplished so much good original work, or displayed so much energy in the prosecution of their medical studies.

Entering the profession with only the education attainable at a country school, he never rested until the study of French and German had opened to him the literature of these two languages, which he thereafter constantly studied. An untiring worker, he was always on the search, not for theories, but for facts. A close observer, nothing escaped him. Every fact which had the slightest bearing on the origin, course, or treatment of disease, was carefully noted, and it was only when he was thoroughly satisfied with the correctness of his observations that he gave them to the public.

As a clinical lecturer he had few superiors. No one who heard him will ever forget his manner in the lecture-room. A little above the average height, with black eyes, black hair and beard, his spare form and ascetic appearance at once attracted attention. Warming with his subject as he advanced, he seemed to forget all else. His flashing eye and clear voice held the class in close attention, while he gave every detail of the case, and then proceeded to a critical

examination of the value of each symptom. Nothing was forgotten; one by one conclusions were gathered, estimated, and placed in their proper position, one above the other, until at last, without confusion, he presented to the student a comprehensive and intelligible study of the case under consideration.

Not only a lover of truth, he had a bitter hatred of falsehood, and attacked error in every form regardless of the place or person. In this he was uncompromising, and often, from the strength of his denunciation, gave the impression of hostility to the individual, when he only meant to denounce the incorrectness of the conclusions.

With him to live, and to work, were correlative terms. Life held for him no pleasure equal to that of working, and when sickness forced him to be idle, he was very unhappy.

His associates in the medical societies, recognizing his great merits, hastened to bestow upon him the honors in their gift, and, at the time of his death, he was one of the Council of the College of Physicians, President of the Obstetrical Society, and Vice-President of the Pathological Society.

From Dr. Parry's life and death there are two lessons to be learned. The first shows how surely a man, possessing ability, honesty, and industry, even though a stranger, can become so prominent in his profession, that when he dies not only is a profound grief felt by all his friends and acquaintances, but a deep sense of the great loss to the profession to which he belonged is realized by all his contemporaries and co-workers. The second, is the absolute necessity of physical and mental rest if the full measure of our lives is to be run out. Had Parry better comprehended this last, and acted on its teachings, he might have yet been spared to us. Taken

away at an age when most men are but emerging from obscurity, he had made for himself a reputation, and secured a position, such as few attain even after a long life.

No more appropriate conclusion to this brief memoir can be found than the following preamble and resolutions presented by Dr. Stillé to this college, and unanimously adopted at its stated meeting of May 3, 1876:—

The College of Physicians, having learned with deep regret the death of their late fellow, Dr. John S. Parry, and being desirous of expressing their estimate of his character and attainments, have adopted the following resolutions:—

I. That his natural acuteness of mind, stimulated by an ardent love of knowledge, a thorough general education, and the cultivation of natural history, prepared him for the distinction he gained as an industrious, cautious, and intelligent investigator of disease, and led him constantly to aim, above all things, at discovering and teaching truth in its simplicity.

II. That our medical community has hardly furnished another example of a physician, who, at so early an age, performed so much substantial work, exhibited so clear an insight into the subjects that he studied, or more fully illustrated the value of clinical experience, guided by sound judgment, and elaborated by literary and scientific skill.

III. That Dr. Parry's modesty was as sensitive as his consciousness of power was decided; that the affability of his manners and the simplicity of his mode of life, his virtuous, frank, and honorable conduct, his patience under prolonged suffering, and his resignation to his untimely fate, were in beautiful harmony with his earnest love of truth, and his zealous efforts to advance professional knowledge.

LIST OF WORKS AND PAPERS PUBLISHED BY DR. JOHN S. PARRY.

1865. Vesico-abdominal Fistula. Medical and Surgical Reporter, Philadelphia, Sept. 30, 1865.

1870. Observations on Relapsing Fever as it occurred in Philadelphia in 1869 and 1870. American Journal of the Medical Sciences, Oct. 1870.

Case of Rachitis. Proceedings of Pathological Society of Philadelphia, 1870.

Thrombosis in a Puerperal Woman; Pneumonia; Temporary Aortic Regurgitation. Philadelphia Medical Times, Dec. 1, 1870.

1871. Clinical Lectures on Infantile Paralysis. Ibid., Feb. 15 and March 1, 1871.

Infant Mortality and the necessity for a Foundling Hospital in Philadelphia. Read before the Social Science Association, May, 1871.

Case of General Tuberculosis in a Child. Proceedings of Pathological Society of Philadelphia, 1871.

Clinical Lectures on Pelvic Peritonitis. Philadelphia Medical Times, Aug. 1 and 15, 1871.

Case of Pseudo-pregnancy and Nervous Palpitation of the Aorta. Ibid., Aug. 1, 1871.

Case of Inherited Syphilis. Photographic Review of Medicine and Surgery, Philadelphia, Feb. 1871.

Case of Carcinoma Uteri in a Negress. American Journal of Obstetrics, Aug. 1871.

A Local Outbreak of Typhoid Fever. Philadelphia Medical Times, Nov. 15, 1871.

Sudden Enlargement of and Hemorrhage into Ovarian Cysts. American Journal of Obstetrics, Nov. 1871.

1872. Observations on the frequency and symptoms of Rachitis, with the results of the Author's clinical experience. American Journal of the Medical Sciences, Jan. 1872.

Vaccination: its uses, and alleged abuses. Read before the Social Science Association. Penn Monthly, Feb. 1872.

Remarks on the Pathological Anatomy, Causes, and Treatment of Rachitis. American Journal of the Medical Sciences, April, 1872.

Case of Primary Cancer of the Vagina. Philadelphia Medical Times, April 1, 1872.

Clinical Lectures on Inherited Syphilis. Ibid., Sept. 2 and 16, 1872.

1873. The local treatment of Cancer of the Female Genitals. Ibid., Feb. 1, 1873.

The comparative merits of Craniotomy and Cæsarean Section in Pelves with a conjugate diameter of two and a half inches or less. American Journal of Obstetrics, Feb. 1873.

Abscess of the Larynx in Young Children. Philadelphia Medical Times, June 14, 1873.

Review of Dr. George Lewin's "Treatment of Syphilis with Subcutaneous Sublimate Injections." Ibid., June 21, 1873.

The Histories of Three Cases of Rupture of the Uterus. American Journal of Obstetrics, Aug. 1873.

Review of the Columbia Hospital Report. American Journal of the Medical Sciences, Oct. 1873.

Review of Hewitt and of Atthill on the Diseases of Women. Ibid., Oct. 1873.

1875. Description of a form of Puerperal Fever which occurred at the Philadelphia Hospital, characterized by diphtheritic deposits on wounds of the genital passages, and by other peculiar phenomena. Ibid., Jan. 1875.

Review of Henry Fly Smith's Hand-book for Midwives. Ibid., Jan. 1875.

The Use of the Hand to correct unfavorable Presentations and Positions of the Head during Labor. American Journal of Obstetrics, May, 1875.

Epilepsy in Pregnant and Parturient Women. Ibid., Aug. 1875.

Additions to the Second American Edition of Leishman's System of Midwifery, Philadelphia, 1875.

Extra-Uterine Pregnancy. Its Causes, Species, Pathological Anatomy, Clinical History, Diagnosis, Prognosis, and Treatment. 8vo. pp. 275. Philadelphia, 1875.

CASE

OF

EMPYEMA,

IN WHICH, AFTER DIEULAFOY'S ASPIRATOR HAD BEEN REPEATEDLY USED, A PERMANENT CURE FOLLOWED THE INTRODUCTION OF CHASSAIGNAC'S DRAINAGE TUBE INTO THE CHEST; WITH REMARKS.

By

JAMES H. HUTCHINSON, M.D.,

ONE OF THE ATTENDING PHYSICIANS TO THE PENNSYLVANIA HOSPITAL; PHYSICIAN TO THE CHILDREN'S HOSPITAL, ETC.

[Read November 3, 1875.]

After reading the notes of this case I shall bring the little patient himself before the College, in order that the Fellows may have the opportunity to examine him. He was originally under the care of Dr. Louis Starr, who has very kindly sent me full notes of the case up to the time of its admission into the Children's Hospital, where it first came under my observation. To Dr. Starr's courtesy I am also indebted for the cyrtometric tracings of the chest, with which this paper is illustrated, and which add materially, I think, to its interest. The notes of the case, subsequent to the time of its admission into the hospital, were taken by Dr. Curry, the Resident Physician.

There are, I believe, some points of especial interest in this case, but the discussion of these it will be better to postpone until after the reading of the notes.

Edward ——, aged 7 years, was brought to the "Boarding Home for Little Children" on February 15, 1875, during the prevalence of an epidemic of scarlatina. His family history was moderately good, but his mother stated that his health had always been delicate, and that for several months previous to his admission he had had very insufficient attention in regard to cleanliness, clothing, and food. At that time he was pale and emaciated, and on the outer side of each heel there was a superficial ulcer, nearly an inch in diameter; these were supposed to have resulted from chilblains.

On February 20, the boy was seized with a chill, followed by fever, sore throat, nausea, and vomiting; and he subsequently passed through an attack of scarlet fever, the rash being dusky in hue, and irregularly distributed over the body, and the temperature, which was never very high, falling about the fifth day. After this he was weak and irritable; there was moderate enlargement of the parotid glands, and his appetite was poor; but he steadily improved under the employment of tonics until March 18, when, as there was no œdema or abnormal appearance in the urine, he was allowed to sit up for a short time. On the 19th he sat up for one hour. On the 20th, however, he was ordered to remain in bed, as there were slight sensations of chilliness, some heat of skin, and evidences of commencing desquamation. The temperature continued to rise through the day, and on the 21st the following symptoms were observed: surface hot and dry, pulse 120, face œdematous, severe headache, and great irritability of temper; tongue heavily coated, thirst urgent, abdomen tympanitic, and bowels loose. Nothing abnormal was observed with regard to the heart and lungs, and there was no effusion into the serous cavities, or œdema of the extremities. The urine was scanty, smoke-colored, acid in reaction, had a sp. gr. of 1022, deposited after standing for a short

time an abundant reddish-brown sediment, and contained a large amount of albumen. The patient was ordered a milk diet, warm baths, and a prescription containing Potass. bitart., Spt. junip. comp., and Spt. æth. nit.

On the 24th the respiratory movements became frequent, numbering 40 in a minute; there was a short, partially suppressed cough, and pain in the epigastrium and lower third of the left chest anteriorly; in the latter position also a few fine friction râles could be heard, and there was slight impairment of percussion resonance. Six small dry cups were applied in the neighborhood of the seat of pain, the left side of the chest was enveloped in a poultice, and the baths were discontinued. For the next four days the boy was extremely ill, his pulse ranging from 140 to 160, the respiration being, at times, as high as 60 per minute, and the œdema increasing; the urine, on the other hand, was passed more freely, was clearer, and contained less albumen, though numerous large epithelial casts were discovered on microscopical examination. During this period, in addition to the diuretic mixture, the patient had a three grain quinine suppository every eight hours, a diet of milk and beef-tea, and a moderate quantity of stimulants (brandy and carbonate of ammonia), while poultices were kept constantly applied to the chest.

On March 29, the boy was somewhat better, and by April 5, his general condition had so far improved that it was deemed justifiable to make a thorough examination. The symptoms now observed were as follows: decubitus left sided, with head and shoulders elevated; cheeks flushed, but surface generally pale and waxy; great œdema of the face, most marked on the left side; abdomen tympanitic, and a small amount of fluid in the peritoneal cavity; scrotum œdematous, and slightly discolored; legs and arms emaciated, affording a great contrast to the tympanitic belly and swollen face. Tongue coated, appetite poor, and a tendency to diarrhœa. Pulse weak, 120, growing more frequent towards evening, when there was increased heat of skin, flushing of face, thirst, restlessness, and irritability; throughout the rest of the day

he was languid and inclined to sleep. Cough infrequent and dry, respiration about 40, though readily increased by exertion or excitement to 58 or 60. The left side of the chest was distended, and almost completely immovable; the intercostal depressions were effaced; the left nipple was higher and further from the centre of the sternum than the right, and the left scapula was elevated and thrown outward. There was flatness on percussion over the whole of the left thorax, from apex to base, most intense on the posterior surface, where there was great resistance; over the lower third, anteriorly, there was transmitted gastric tympany. Bronchial breathing was heard over the whole of the affected side, being most distinct near the angle of the scapula posteriorly; there were no râles. The vocal resonance was reedy, while vocal fremitus was entirely absent. The heart sounds were most audible to the right of the sternum; there was no valvular murmur; but a transmitted cardiac impulse was seen in the epigastrium. The patient complained of soreness on the left side, and the act of percussion caused pain. The right lung was normal, except that its functional activity was augmented, the respiratory movements and the vesicular murmur being exaggerated. The urine was passed freely, and contained a very small quantity of albumen, discovered only by Heller's method, and a few epithelial and slightly granular casts. Directions were given to paint the chest with tincture of iodine, and to keep the scrotum covered with cloths wet with laudanum and lead-water; and Basham's mixture was substituted for the diuretic preparation formerly used; the rest of the treatment was continued as before.

Throughout the succeeding two weeks, although the pleuritic effusion slowly increased, and though the hectic fever was still observed in the latter part of the day, the pulse fell to 108, the respiration to 32, the tongue cleaned, the appetite improved, the diarrhœa ceased, the tympanitic distension of the abdomen and ascites diminished, the œdema of the scrotum disappeared, and that of the face greatly subsided.

After this the patient again grew worse, and on April 25, paracentesis thoracis was determined upon.

On the morning of the operation, the left chest at the level of the 5th rib measured one inch more than the right; the intercostal spaces were slightly bulging; the left nipple was half an inch further from the centre of the sternum, and half an inch higher, than the right; the flatness and lack of elasticity were very marked; and there was loud bronchial breathing in the infra-clavicular and inter-scapular regions, and at the angle of the scapula, but over the lower two-thirds of the chest the breath sounds were feeble and distant; in other respects the physical signs were unchanged, with the exception of the percussion resonance on the right side, which was rather high pitched. There was extensive œdema of the face, lower part of the body, and scrotum; frequent pulse and respiration; and paroxysmal cough, unattended by expectoration. The urine was abundant and slightly albuminous, and the microscope revealed granular and epithelial casts.

The point selected for puncture was in the 7th interspace, just outside of the mid-axillary line. The skin having been frozen, a small incision was made, and a medium-sized canula, attached to Dieulafoy's aspirator, introduced. About three ounces of healthy pus were withdrawn, when the flow stopped, and, notwithstanding that the direction of the canula was changed, it was impossible to remove any more. The operation was attended with but little pain or cough, and was followed by no increased constitutional disturbance, but, on the other hand, by no evident improvement in the physical signs, other than trifling diminution in the flatness over the infra-clavicular region. For several days afterwards there was considerable pain and tenderness near the point of puncture, so that the boy was obliged to lie entirely on the right side.

On May 1, the patient was removed to the Children's Hospital.

May 1. The boy when admitted into the Children's Hospital was very much emaciated, pale and feeble, but able to sit up in bed while a physical examination of his chest was being made. The results of this so closely resembled those obtained by Dr. Starr, that it would be unnecessary repetition to record them here. They indicated very clearly the existence of an effusion, completely filling the left pleural cavity, an effusion which the tapping done by Dr. Starr had shown to be purulent. A slight trace only of albumen could be detected in the urine, the specific gravity of which was 1018. The patient was directed to have a teaspoonful of Basham's mixture every three hours.

May 4. The œdema of the feet has disappeared. The eyelids of the left side are, however, still swollen, but this is unquestionably owing to the fact that the patient lies constantly on his left side; there is no œdema of any other part of the body. Physical signs remain unchanged.

May 15. The patient is becoming weaker. There is a distinct febrile exacerbation towards evening, the morning temperature being 99°, the evening, 102°. Inasmuch as diuretics have not had the slightest influence in diminishing the amount of liquid in the chest, it was resolved, after consultation with Dr. Hodge, to repeat the operation of tapping. The instrument used was, as in the previous operation, Dieulafoy's aspirator, and the point selected for puncture the same as that chosen by Dr. Starr, but no incision was made before introducing the trocar. In consequence of an obstruction in the tube, only a single fluidounce of pus was obtained at this time.

May 17. The instrument having been carefully tested, and found to be in good order, Dr. Hodge introduced the trocar at the same point as on the previous occasion, and drew off about twenty ounces of thick creamy pus, with the effect of giving great relief to the child, the dyspnœa which had previously been a distressing symptom almost entirely disappearing.

May 18. No bad effects have followed the operation, the patient having rested last night better than he had done for a week past. A physical examination of the chest gives the following results. *Left side:* Feeble vocal fremitus can be felt over the anterior surface of the chest down to the sixth rib, also in the inter-scapular region. Bronchial respiration and bronchophony are louder than before the withdrawal of the liquid. Ægophony can be heard at the inferior angle of the scapula. *Right side:* The physical signs are normal. The heart, which before the operation could be felt beating in the fifth interspace, just within the right nipple, has been drawn slightly over towards the left side.

May 29. During the past week the temperature has been constantly over 100° in the morning, and frequently as high as 103° in the evening. The physical signs indicating a re-accumulation of the liquid, the operation of paracentesis was repeated by Dr. Hodge; this time thirty fluidounces of a liquid, identical in appearance with that previously obtained, were removed. The patient bore the operation perfectly well.

June 1. The chest was again examined to-day. Percussion gives a high-pitched tympanitic resonance over the upper part of the left side, both anteriorly and posteriorly. Below, there is dulness. Above the spine of the scapula, and in the infra-clavicular space, bronchial breathing, bronchophony, and vocal fremitus are distinctly perceived. They are less marked over the lower part of the chest, but even vocal fremitus is nowhere entirely absent.

June 9. The left side of the chest is evidently again filled with liquid, and unless the boy can be relieved permanently it is manifest that he will sink. In order to afford him a chance, Dr. Hodge introduced, at Dr. Hutchinson's request, a fenestrated India-rubber tube into the chest. The operation was performed by entering a large needle with an eye near the point at the seventh interspace, and bringing out the point at the ninth interspace a little posterior to the mid-axillary line. The needle was then threaded with the

India-rubber tube and withdrawn in the reverse direction to that by which it had been passed into the chest, bringing out through the upper opening one end of the tube while the other end remained outside the lower opening. The two ends were loosely tied together in order to prevent slipping, and the boy was sent to bed.

June 10. A very large amount of pus has escaped through the tube since its insertion. The chest is to be washed out every day through the drainage tube, with a two per cent. solution of carbolic acid. The operation was well borne.

June 22. Pus has been discharged freely ever since the date of last note. It has never been of an offensive character. Patient's general condition has very much improved since the operation, and there is now a fair prospect of his recovery. The pulse and respiration are both diminishing in frequency, and the symptoms indicating hectic fever are gradually disappearing. Coarse broncho-vesicular breathing is heard over the whole of the upper part of the left chest, vocal resonance is quite distinct, and the percussion note in the same region approaches that of health, though it is still somewhat elevated in pitch and tympanitic in quality. At the lower part of the chest, resonance is still deficient, and the respiratory sounds are indistinct and distant.

July 1. The patient was to-day sent to the "Children's Sea Shore House" at Atlantic City. His condition is improving. There is still a free discharge of pus through the drainage tube, which has not yet been removed. For the last two weeks a four per cent. solution of carbolic acid has been used as an injection, instead of, as at first, a two per cent. solution.

September 14. The boy has returned from Atlantic City very much improved in health. He has gained strength and flesh to such a degree that he is scarcely recognizable. Although the drainage tube still remains in his chest, there is little discharge through it, and it does not interfere with his comfort or with his amusements.

September 18. The drainage tube was removed to-day by Dr. Wm. Pepper, under whose care the case has passed. It has been somewhat corroded by its long-continued maceration in pus.

October 24. A very little discharge took place from either opening in the wall of the chest after the removal of the tube. A solution of the permanganate of potassa was injected once into the pleural cavity by Dr. Pepper's directions, but it was not thought necessary to repeat the operation. Both openings are now closed; cicatrization of the lower opening having taken place towards the close of September, and of the upper a few days ago.

Upon physical examination, a very slight deflection of the dorsal portion of the spinal column towards the right is found to have taken place. The apex-beat of the heart is seen and felt in the fourth interspace, about an inch within the left nipple. There is slight depression of the left infra-clavicular region, and a good deal of retraction of the left inferior axillary region. At the level of the nipples the difference between the circumference of the two sides is three-quarters of an inch. Percussion gives a clear sound, rather more high-pitched than normal over the whole of the left side of the chest, except over the posterior surface, below the ninth rib, where the sound is dull. In this position there is a scarcely perceptible vocal fremitus, but over all other parts of this side of the chest, this sign can be distinctly recognized. A somewhat harsh vesicular murmur, approaching broncho-vesicular respiration in character, exists everywhere over the chest, and, occasionally, in the axillary region, there is a slight friction râle. The vocal resonance is nearly normal. The physical examination of the right side of the chest shows it to be healthy. The urine has been carefully tested, and found to be free from albumen and casts.

[The patient was then presented.]

In this case the empyema was not the original disease, but occurred as a complication of acute Bright's

disease, which was itself a sequel of a severe attack of scarlet fever—facts, I need not say, which rendered the prognosis very much more serious. Notwithstanding which Dr. Starr determined, wisely, I think, to draw off the liquid from the chest. His failure to obtain more than a few ounces is not readily intelligible, as the instrument he used appears to have been in good working order. It was probably owing to a piece of false membrane temporarily obstructing the aspirating needle. Dr. Hodge's want of success, at first, and its cause, have already been referred to in the notes.

When I determined to have recourse to the operation of paracentesis thoracis, the patient was suffering not so much from interference with the respiration as from hectic; and my fear was, that, unless the cause of irritation was removed, he would die from exhaustion.[1] Twenty ounces of pus only were withdrawn, upon the first occasion when the operation was really successfully performed; more might have been obtained, but I thought it prudent to desist at this point. The relief afforded by the operation was only of short duration, for the chest filled up rapidly, necessitating a repetition of the tapping in less than two weeks, when thirty ounces were drawn off—as much as could be obtained with the aspirator. Notwithstanding this thorough emptying of the chest, the liquid re-accumulated so rapidly that it was determined on the ninth of June to introduce a Chassaignac's fenestrated drainage tube, which, while it allowed the discharge of pus as

[1] I should unquestionably have had recourse to tapping earlier than I did, but for the failure of Dr. Starr to obtain more than three ounces of pus.

fast as it was formed, could also be used for the purpose of injecting the pleural cavity with some antiseptic solution. It, of course, permitted the entrance of air, but it also prevented its retention. In other words, if air entered the cavity of the chest, it entered freely and was discharged freely, and thus did not become possessed of irritating qualities. The boy rapidly improved after this operation, and was so well on the 1st of July that he was sent to the sea-side, whence he has only recently returned very much improved in health. All these operations were performed without previous incision of the skin, and without the employment of an anæsthetic.

It is somewhat strange that, notwithstanding the number of times that Dr. Bowditch, of Boston, has performed the operation of paracentesis thoracis, there are still many physicians in this city who rarely, if ever, have recourse to it. When done with Dieulafoy's aspirator it occasions so little pain, and is generally followed by so little constitutional disturbance, that I cannot see how doubt as to its propriety can any longer be maintained. Dr. Bowditch has used the instrument which bears his name no less than 250[2] times in twenty years, on 154 persons, without the occurrence of a single accident. Admirable as this instrument is, its inferiority to Dieulafoy's aspirator as a means of emptying the pleural cavity will, I think, be generally admitted. In fact it is safe to say that, by the use of the latter instrument, the danger is reduced to a minimum.

[2] Trans. Clinical Society of London, vol. v. p. 43. Since this statement was published I have heard that Dr. Bowditch has had two deaths from the operation, and that he attributes these to the employment of ether.

I believe, however, that the fortunate result which has been obtained in this case is owing in a large measure to the introduction into the chest of a drainage-tube, by which the accumulation of pus was prevented. I know there are many among the advocates of the operation of paracentesis thoracis who have doubts about the propriety of establishing a permanent com-

FIG. 1.

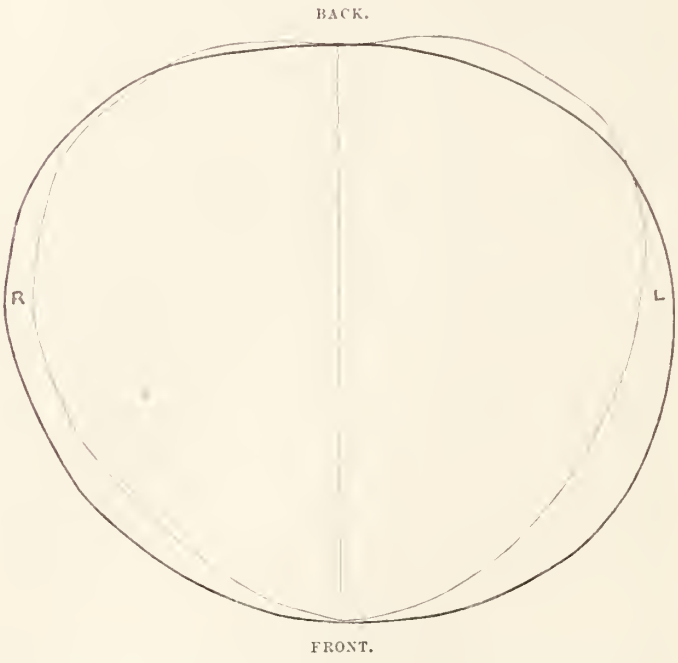

FIG 1. Cyrtometric tracings taken at level of fifth intercostal space. (Reduced by the camera.) The heavy line represents the tracing taken April 10, and the light line that taken October 28, 1875.

munication between the chest and the outer air. That this may sometimes be done even in patients who are otherwise unfavorable subjects for operations generally, not only without danger but with positive benefit, the

case I show you to-night will, I think, sufficiently prove. My only regret now connected with my management of this case is that I did not sooner have recourse to the drainage-tube. I would advise its employment in empyema generally, in any case where two tappings have failed to procure permanent relief, especially if there be a rapid re-accumulation of liquid; hoping in this way, to avoid the compression of the lungs, and, to a certain extent at least, the deformity of the chest which results from this.

FIG. 2.

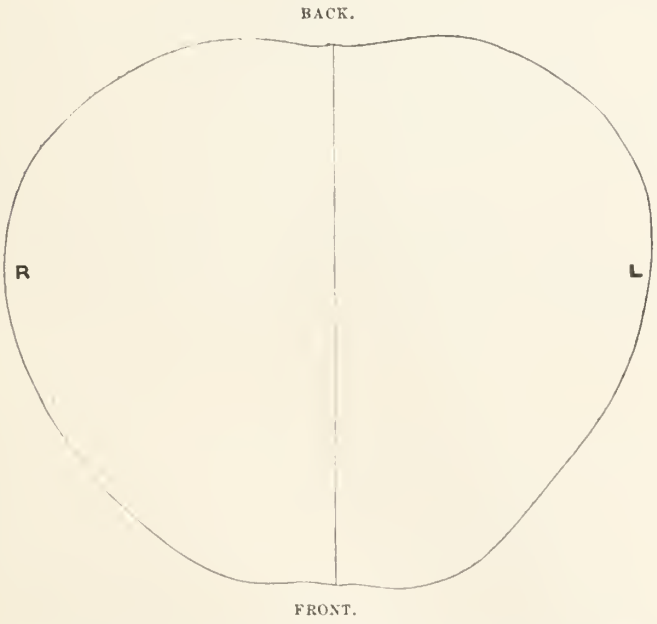

FIG. 2. Cyrtometric tracing taken at level of seventh intercostal space. November 20, 1875. (Reduced by the camera.)

An inspection of the boy's chest, as well as these cyrtometric tracings (Figs. 1, 2), will show that very little deformity has taken place. The vertebral column

is deflected slightly to the right, but so slightly that the change would escape notice if attention were not specially called to it, and cannot be recognized at all except when the boy is undressed.

A comparison of the cyrtometric tracing (Fig. 1) taken on October 28, with that taken on April 10, will show that there is retraction of the *right* side in front, as well as of the *left*. This must unquestionably be due to the fact that the right lung has been drawn over to the left side, to occupy the room unfilled by the incomplete expansion of the left lung. It will also be noticed that there is bulging on each side of the spinal column, most decidedly, however, upon the left side. This would appear, therefore, to be a result of the contraction in front.

The third tracing (Fig. 2) was taken because there appeared to be more retraction of the left infra-axillary region than of any other part of the chest, but the tracing shows that this is much less the case than was supposed.

[After the reading of the preceding paper, Dr. H. LENOX HODGE said—]

In addition to the details given by Dr. Hutchinson in regard to his interesting case, I will simply describe the operation which was done.

A large strong curved needle attached to a stout handle, and having the eye of the needle near its point, was the only instrument used. It was inserted near one of the old points of aspiration, carried around two ribs, and brought out below. A perforated drainage-tube was then passed through the eye of the needle, so as to form a long loop, and the needle withdrawn so as to leave the drainage tube in the cavity of the pleura. The loop of the drainage tube in the eye of the needle was made long, so that if it should be cut through by traction on the needle, both portions could be easily withdrawn without leaving any piece in the pleural cavity. The operation done in this way has the following advantages :—

1. It drains the cavity without the admission of air.
2. It not only empties the cavity but keeps it empty.
3. The drainage tube remains in position, and cannot slip out.
4. The cavity may be syringed with washes to promote healing.
5. If air should enter during movements of the chest, it can also readily pass out.

If a drainage tube be inserted only at one opening, it is so apt to slip out that its action is very inefficient. If a canula and stop-cock be used, and retained between the intervals of drawing the fluid, the walls of the cavity become more or less separated ; and this separation, together with the irritation from the pressure of the canula, interferes with the process of healing. The manner of using the drainage tube above described, therefore, appears to possess many advantages above the other methods.

CASE

OF

HEPATIC ABSCESS

OCCURRING IN A CHILD; EVACUATION BY PUNCTURE THROUGH THE ABDOMINAL WALLS; RECOVERY.

By

LOUIS STARR, M.D.,

ASSISTANT PHYSICIAN TO THE EPISCOPAL HOSPITAL AND TO THE CHILDREN'S HOSPITAL.

[Read Dec. 1, 1875.]

Circumscribed suppurative hepatitis is a disease of such rarity in temperate climates, and, when met with, is so often attended with obscurity in regard to etiology and diagnosis, that the following history of a case which recently came under my observation at the Children's Hospital may not be without interest:—

George ——, æt. 5 years, was first brought to the Dispensary of the Children's Hospital on April 27, 1875, during the service of Dr. George S. Gerhard. Though residing in a malarious locality, and in a poor and filthily-kept house, he had always had good health up to one week previous to the above date, when he began to complain of pain in the region of the umbilicus. Under appropriate treatment he passed several lumbricoid worms, and the pain disappeared. A week later, however, it returned, and, as his bowels were constipated, his father administered a tablespoonful of castor oil; this produced a free evacuation, containing from twenty to

thirty lumbrici, many being of large size. After this he seemed to be perfectly well until May 9, when the pain in the abdomen reappeared; he now began to lose his appetite, and a swelling was noticed in the right hypochondriac region.

When I saw him, on May 15, his general appearance was very good, his cheeks having a healthy color, and his body being sufficiently stout. His tongue was slightly coated, and his father stated that his appetite was poor, and that, though his bowels were moved daily, the passages were small. There was no heat of skin or jaundice, the pulse and respiratory movements were normal in frequency, he had no cough, and, on physical examination, no pulmonary or cardiac affection could be detected. His abdomen was tympanitic, the whole of its upper third was tender to the touch, and in the upper part of the right hypochondrium there was an oval tumor, about as large as a turkey's egg, having its long diameter directed transversely, and projecting at its most prominent part nearly an inch from the surface of the abdomen. The skin covering this tumor was somewhat œdematous, but was freely movable, and natural in color and temperature, while the tumor itself was hard, sensitive, completely immovable, and the seat of neither fluctuation nor pulsation. It was surrounded by an area of induration, the boundary of which could not be accurately ascertained on account of the pain produced by palpation, though it appeared to extend from the costal border to the lower third of the right hypochondriac region, and from the median line of the abdomen to the right side.

The right hypochondrium was dull, except just below the margin of the ribs, where there was slight, probably transmitted, tympanitic resonance, detected only by deep percussion. The liver dulness began in the ordinary position above, and, on light percussion, was continuous below with that of the hypochondriac region. The patient did not complain of pain except when the swelling was touched, or when the whole body was jarred, as in walking down stairs; on a level surface he was able to walk easily. No history of an

injury could be obtained, but on careful questioning it was discovered that throughout the winter he had coasted a great deal on his sled, and always rode "belly-bumpers." He was ordered to be kept quiet, and to have a liquid diet, with poultices over the abdomen, and a dose of castor oil.

May 16. Had a large passage from the bowels, the evacuation being dark colored and lumpy; during the night was restless and feverish.

May 17. Tongue somewhat cleaner and abdomen less tympanitic. The tumor was more prominent; there was deep-seated fluctuation, and the skin covering the mass was less œdematous, not so freely movable as before, and of a dusky-red hue. Patient walked with his body bent forward, as if a more upright posture was painful. Prescribed f℥ss of tinc. cinchon. comp., three times daily, and an increased diet, at the same time directing his parents not to allow him to get out of bed, and to apply warm poultices continuously to the belly.

May 19. Visited him at his home, and found him entirely free from fever; his tongue was clean, his appetite had returned, and his bowels had been opened; the stool, which had been kept for inspection, was copious, well formed, and in every way natural. The induration around the tumor, or more properly the *abscess*, for such it now appeared to be, had extended so as to fill nearly all of the right hypochondrium, being almost five inches in transverse diameter. There was well-marked fluctuation, and the skin investing the abscess was tightly adherent over a space about four inches in circumference. The abdominal respiratory movements were restricted, and any effort at full inspiration caused pain. There was no sensation of throbbing in the abscess, and the patient seemed to be perfectly comfortable as long as he remained quiet. The abdomen was moderately distended.

May 22. No change, other than that the fluctuation was more superficial and the integument adherent over a large surface. The former treatment was continued, and as the pulse was more frequent than before, and as he was pale and

languid, I ordered a teaspoonful of brandy thrice daily, and full diet.

May 26. I found him up and playing about as if nothing was the matter; having had him stripped and placed in bed, the following observations were made: Abscess more prominent than at last note, but more localized; in its centre there is very superficial fluctuation, extending over an area an inch and a half in diameter and bounded by a firm margin. The skin covering this space is dark-red in color, feels very thin, almost as if it could be broken by the pressure of the finger, and is somewhat hotter than the surrounding integument. About the abscess there is a mass of induration which does not project beyond the level of the rest of the abdomen, but which extends from the lower border of the ribs to the middle of the right lumbar region, and from the mid line of the abdomen to the right side; its outline is semicircular, the edge being smooth and well defined, so much so that the fingers can be inserted beneath it. The skin is adherent over the whole mass, but most tightly immediately around the position of fluctuation. Both palpation and percussion indicate that it is connected with the right lobe of the liver. There is some pain excited by palpation, though this is much less than formerly. There is no jaundice. No change was made in the treatment.

May 29. The abscess was more circumscribed, being about the size of an English walnut, and the pus was still nearer to the surface. As it was impossible to keep the patient quiet, and fearing lest he might rupture the abscess in his play, aspiration was determined upon. Accordingly with the assistance of Dr. Simes and Dr. A. V. Meigs, a large aspirator needle was introduced to the depth of half an inch. About two drachms of thick, grumous pus, mixed with blood, escaped into the receiver, when the canula became plugged, and we were unable to withdraw any more.[1] A poultice

[1] A microscopical examination of a portion of this material was kindly made by Dr. Tyson. It was found to contain pus cells, compound granule cells, blood corpuscles, and numerous polygonal cells having well-defined nuclei and resembling liver cells.

was applied, and the patient ordered to remain in bed during the rest of the day. The operation was followed by no bad symptoms, and next day he was up and amusing himself as before. There was, however, considerable discharge of thick pus from the opening left by the aspirator needle.

June 1. The wound made by the needle was closed. Scarcely any fluctuation could be detected, and there was but little redness of the skin. On passing the finger over the position of the abscess a cup-shaped depression was felt, bordered by a well-defined edge of dense tissue. The induration was reduced; its lower margin was still semicircular, and could be easily isolated, while the upper margin, on the other hand, could not be discovered, as the mass extended under the ribs. There was hardly any pain on manipulation, and the boy's general condition was very good.

June 5. There were no signs of the abscess, except a small spot of dusky redness, and slight retraction and puckering of the skin at the point of puncture; in this situation, also, the integuments were adherent to the parts below. The induration was diminishing, and its edge, which could still be distinctly felt, was approaching the right costal border. All treatment was suspended.

On October 30, the child was in excellent health. The skin, for a short distance about the seat of puncture, was somewhat discolored and puckered, and was less freely movable than that of the remainder of the abdomen. Percussion and palpation showed that the right lobe of the liver was slightly contracted.

In reviewing the preceding history, especially when the age of the patient is considered (suppurative hepatitis being an affection of adult and middle life), the question that naturally suggests itself is, whether the disease was hepatic abscess, or merely an abscess of the abdominal wall. In the early stage of the former affection, the general symptoms are similar to

those observed in acute hepatitis, jaundice being present only in exceptional instances, while the formation of pus gives rise to rigors, frequency of the pulse, night sweats, and fever, the latter often resembling the pyrexia of quotidian or tertian intermittents. The almost entire absence of constitutional disturbance in the present case, however, is no argument against the existence of hepatic abscess, as it is generally admitted that the symptoms are often very latent, and that in many instances no suspicion of an abscess has been entertained until its discovery by manual exploration, or by the discharge of pus in various directions, and sometimes even not until revealed by post-mortem examination.

The local symptoms, on the contrary, were well marked; thus there was localized, though extensive, enlargement of the right lobe of the liver, and towards the upper part of this enlargement there was an ill-defined, oblong tumor extending beyond the level of the abdomen. The skin covering this tumor was at first slightly œdematous, but perfectly movable and normal in color and temperature. From day to day, as the tumor became more circumscribed and approached nearer the surface, the hepatic enlargement increased, and conjointly with the appearance of fluctuation the œdema disappeared, the skin became dusky-red in hue, hotter than the surrounding integument, and adherent. There was also tenderness on pressure, pain excited by deep inspiration or any jarring movement, and a peculiar bending forward of the body in walking. Again, after the opening of the abscess, all these symptoms subsided, and there was puckering in of the skin and rapid reduction in the

size of the liver, its projecting margin remaining semicircular, smooth, and well defined; while finally there was slight contraction of the right lobe.

There are two other points which I believe to be of importance, viz., the detection by palpation of a smooth edge of dense tissue bordering the area of fluctuation, which gave the impression that the fluid was contained in a cup-shaped cavity in a solid organ, and the microscopical characters of the pus which was removed.

Now, all these symptoms are characteristic of an hepatic abscess, so situated on the convexity of the liver as to point towards the surface of the abdomen; the adhesion of the integuments being, of course, due to local peritonitis. Abscesses of the abdominal wall, on the other hand, besides being superficial from the outset, have a different position, being usually seated in the rectus muscle or adjoining connective tissue, and in the neighborhood of the umbilicus; at the same time there is generally violent throbbing pain, the redness and tumefaction of the skin are earlier and better developed, and the constitutional symptoms accompanying the formation of pus are more constantly observed than in abscess of the liver.

It seems, therefore, justifiable to assume the existence of suppurative hepatitis in the present instance; yet the case is an unusual one both in respect to its short duration, and the age at which it occurred. On referring to Frerichs's treatise on the subject, it will be found that the average duration, when the pus escapes through the abdominal parietes and recovery takes place, is one hundred and forty days; but the same author states that the course may be much shorter, and the supposition is natural that this would be most likely

to happen when the abscess is small, the subject young, and the general health good. In regard to the age of the patient, I have been unable to find any recorded case in which the affection was noticed so early in life.

Since the hepatic inflammation was not preceded by injury to the liver, or by any symptoms of intestinal ulceration or disease of the gall-bladder, it most probably originated spontaneously, an occurrence by no means rare, especially in temperate climates; unless indeed, as appears very improbable, the irritation produced by the presence of lumbricoid worms in the intestinal canal was a sufficient cause. The trifling concussions, also, sustained in sledding, seem to be entirely inadequate to occasion injury to an organ which is so well protected by the ribs.

The general treatment of circumscribed hepatitis, prior to the formation of pus, if the symptoms are such as to lead to a diagnosis at this time, simply requires careful regulation of the diet, rest, and attention to the various functions of the body, particularly that of the bowels, for even when the existence of inflammation is ascertained, it is hardly probable that anything can be done to prevent suppuration.

In relation to the propriety of evacuating hepatic abscesses, the bulk of authority is in favor of so doing, when they point externally so as to be detected by palpation, when firm adhesions have formed, and when the pus is near the surface. As to the method of evacuation, a free incision is perhaps preferable to puncture with an aspirator needle, because, first, the pus is often mingled with shreds of connective tissue and broken-down liver substance, which are liable to

obstruct the needle and render it useless, or, even if all the fluid is withdrawn, to remain and prolong the process of suppuration; and because, secondly, since, on account of the inelasticity of the walls of the cavity, the entrance of air cannot be prevented, it is much better to provide a free way of exit, than to have the air confined, as it would be likely to be from the small opening made by the needle becoming closed. For the purposes of exploration, however, the aspirator may be used with advantage. After being opened, the abscess is to be dressed in the ordinary manner, while strict rest should be enjoined, and tonic and supporting measures employed. Subsequently, nutritious diet and exercise in the open air, the latter adapted to the strength of the patient, are much more important than mere medication.

REPORT

OF THE

COMMITTEE ON METEOROLOGY AND EPIDEMICS FOR THE YEAR 1875.

By

RICHARD A. CLEEMANN, M.D.,

PHYSICIAN TO ST. MARY'S HOSPITAL.

[Read March 1, 1876.]

Agreeably to appointment, I respectfully submit to the College the following Report on Meteorology and Epidemics for the year 1875. As no report on these subjects for 1874 was offered to you, an effort has been made to supply that deficiency by instituting in this one quite a full comparison of the two years, which necessarily involves the presentation of the leading features of each.

Meteorology.

For the meteorological data employed we are indebted to F. M. M. Beall, Observer, Signal Service, U. S. A., in charge of the station in this city; the records of his office having been thrown open to us through the courtesy of the Chief Signal Officer of the Army. The observations extend but a few years back, but possess some advantages over those accumulated at the Pennsylvania Hospital, which have been

made use of by your committee for many years past. With reference to the item of mean temperature, however, differing in the two sets of observations, the records of the Pennsylvania Hospital have been quoted as well. The difference is due to the thermometers of the Signal Station being placed in a higher stratum of air, away from the disturbing influence of transient local causes, to the use of a greater number of observations in computing the mean, and to instrumental variation.

Temperature.—The year 1875, as seen from the annexed tables (A. and B.), was a cold one, the average of the thermometer for the year being 50.3° Fahr., which is 2.3° less than that for 1874, 52.6°, and 1.2° below the mean for the last four years; or, according to the Pennsylvania Hospital records, the mean temperature of 1875 was 50.9° Fahr., having been 2.7° below the average for 51 years, 53.6°. The differences between the two years and the departure of both from the averages of four years were chiefly due to variations in the colder months, the summers approximating the general mean. Comparing the two years, month by month, January, February, March, June, September, October, November, and December, in 1875, are found to have been colder than the corresponding months in 1874, by 10°, 7°, 6°, 3°, 4°, 2°, 2°, respectively; April, May, and August warmer by 3°, 2°, and 1°; while July had the same mean temperature in each year. The lowest point to which the thermometer fell, in 1875, was —5° (in the month of January), and the highest reached 95° (in June), making the annual range 100°; the corresponding values in 1874 were 10.5°

TABLE A.—METEOROLOGICAL ELEMENTS OF THE CLIMATE AT PHILADELPHIA FOR 1875.

Furnished by F. M. M. Beall, Observer, Signal Service, U. S. A.

Date.	Mean humidity.	Barometer							Thermometer.							Wind.							Amount of rain and melted snow.		Number of auroras.
		Mean.	Mean of			Range.			Mean.	Mean of			Range.			Prevailing direction.	Number of miles.						Amount in inches.	Number of days on which rain or snow fell.	
			A. M. observations.	P. M. observations.	Night observations.	Highest.	Lowest.	Difference.		A. M. observ'ns.	P. M. observ'ns.	Night observ'ns	Maximum.	Minimum.	Difference.		Noon to 6 P. M.	6 P. M. to midnight.	Midnight to 6 A. M.	6 A. M. to noon.	Maximum velocity during month.	Total.			
January,	71	30.231	30.272	30.201	30.220	30.787	29.666	1.121	26.1	23.0	28.8	25.6	44.5	—5	49.5	N. W.	3028	1807	1808	1986	30	8,629	2 83	16	Nobe seen.
February,	66	30.131	30.162	30 092	30.153	30.671	29.370	1.301	26.1	21.9	30.7	24.1	57.0	—1	58.0	N. W.	2327	....	....	....	45	8,159[1]	3.20	12	One.
March,	69	30.104	30.145	30.074	30.101	30.491	29.380	1.111	34.9	31.1	38.8	34.2	61.0	12	49.0	E.	....	....	....	....	42	7,278[2]	3 10	16	None seen.
April,	59	29.978	30.011	29.933	29.985	30.499	29.551	0.898	45.5	40.7	50.9	43.4	71.0	20	51.0	N. W.	....	....	....	....	36	7,322[3]	2.85	16	"
May,	54	29.993	30.018	29.946	30.001	30.325	29.457	0.868	61.4	57.8	68.5	58.4	89.0	40	49.0	S. W.	....	....	....	....	42	7,676	1.36	9	"
June,	65	30.034	30.061	29.996	30.037	30.239	29.711	0.528	70.5	66.6	77.0	67.0	95.0	51	44.0	S. W.	....	....	....	....	45	6,544	4.13	14	"
July,	66	29.996	30.014	29.957	29.995	30.259	29.631	0.628	74.6	72.0	80.4	72.1	92.0	61	31.0	S. W.	2036	1415	1158	1591	36	6,200	3 63	11	"
August,	76	30.035	30.052	30.009	30.037	30.333	29.719	0.614	72.4	69.9	76.5	70.3	85.0	58	27.0	S. W.	2002	1409	1350	1740	30	6,501	6.42	18	"
Sept.	65	30.035	30 059	30.002	30.038	30.429	29.573	0.856	64.1	60.1	70.3	61.4	90.0	45	45.0	W.	1961	1310	1309	1676	34	6,256	2.53	6	"
October,	65	30.015	30.043	29.968	30.020	30.555	29.361	1.194	53.7	49.1	59.9	51.1	74.0	35	39.0	W.	2153	1773	1493	1837	40	7,256	1.42	8	"
Nov.	68	30.107	30.130	30.085	30.118	30.750	29.536	1.214	39.7	36.7	43.6	37.9	62.0	8	54.0	W.	1977	1651	1718	1993	42	7,339	5 40	14	"
Decemb'r,	76	30.042	30.063	30.027	30.036	30.743	29.419	1.324	34 7	31.5	37.2	34.1	65.0	4	61.0	N. W.	3211	1753	1715	1986	35	8,665	3.37	14	"
Total,	..	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.....	87,825[4]	40.24	154	One.
Annual mean	67	30.059	30.086	30.024	30.062	30.503	29.531	0.971	50.3	46.7	55.2	48.3	73.8	27.3	46.5	....	....	....	....	....	38				

[1] 26 days. [2] 28 days. [3] 29 days. [4] 356 days.

TABLE B.—COMPARISON OF METEOROLOGICAL ELEMENTS OF THE CLIMATE AT PHILADELPHIA FOR THE YEARS 1872, 1873, 1874, 1875, WITH AVERAGES.

August.	Rainfall.		7.81	11.49	5.65	6.42	7.84		
	Mean humidity.		....	75.4	61.3	76	70.9		
	Mean barometer		30.045	30.065	30.030	30.035	30.044		
	Ther-m'ter.	Range	34.0	33.0	40.0	27.0	33.5		
		Mean.	75.9	72.3	71.1	72.4	72.9	76.33	74.09
July.	Rainfall.		9.20	5.00	2.25	3.63	5.02		
	Mean humidity.		....	62.7	64.1	66	64.3		
	Mean barometer.		29.970	30.023	30.030	29.996	30.014		
	Ther-m'ter.	Range.	28.0	33.0	31.0	31 0	33.2		
		Mean.	78.6	76.4	74.7	74.6	76.1	75.50	76.58
June.	Rainfall.		4.29	0.90	3.02	4.13	3.08		
	Mean humidity.		....	63	64.1	65	64		
	Mean barometer.		29.976	29.996	29.990	30.034	29.999		
	Ther-m'ter.	Range.	36.0	43.0	46.0	44.0	42.2		
		Mean.	72.7	70.6	73.0	70.5	71.9	72.00	71.96
May.	Rainfall.		2.15	5.83	2.75	1.36	3.02		
	Mean humidity.		....	60.3	57.7	54	57.3		
	Mean barometer.		29.975	30.009	29.982	29.993	29.989		
	Ther-m'ter.	Range.	43.0	45.0	51.0	49.0	47.0		
		Mean.	61.5	59.6	59.9	61.4	60.6	63.16	62.83
April.	Rainfall.		2.60	3.51	9.76	2.85	4.68		
	Mean humidity.		....	47.5	72.2	59	59.6		
	Mean barometer.		30.063	29.947	30.055	29.978	30.011		
	Ther-m'ter.	Range.	54.0	35.0	46.5	51.0	46.6		
		Mean.	51.6	45.3	42.5	45.5	46.2	47.76	51.82
March.	Rainfall.		3.67	2.04	2.16	3.10	2.74		
	Mean humidity.		....	....	64.0	69	66.5		
	Mean barometer.		30.054	30.001	30.022	30.104	30.060		
	Ther-m'ter.	Range.	52.0	53.0	48.0	49.0	50.5		
		Mean.	32.1	39.1	40.0	34.9	36.5	35.50	40.99
February.	Rainfall.		1.12	4.75	2.46	3.20	2.88		
	Mean humidity.		....	....	67.7	66	66.8		
	Mean barometer.		30.011	30.016	30.174	30.131	30.083		
	Ther-m'ter.	Range.	45.0	50.0	64.0	58.0	54.0		
		Mean.	31.2	29.8	33.2	26.1	30.1	26.22	32.95
January.	Rainfall.		.95	5.84	4.53	2.83	3.55		
	Mean humidity.		....	....	70.7	71	70.8		
	Mean barometer.		30.053	30.113	30.193	30.231	30.147		
	Ther-m'ter.	Range.	43.0	60.0	55.5	49.5	52.0		
		Mean.	29.4	28.9	36.7	26.1	30.3	25.72	31.81
Year.			1872	1873	1874	1875	Mean of 4 years	1875	Mean of 51 years
Authority.			Records of United States Signal Station.					Records of Pennsylvania Hospital.	

TABLE B—*continued.*

The whole year.	Mean of thermometer.	51.8	51.4	52.6	50.3	51.5	50.91	53.65
	Mean of barometer.	30.047	30.041	30.089	30.059	30.059		
	Mean humidity.	....	....	65	67	....		
	Rainfall.	46.79	54.62	46.31	40.24	46.99		
	Number of days on which rain fell.	....	160	136	154	....		
	Prevailing winds.	N.W.	S. W.	S. W.	S. W.	S. W.		
December.	Rainfall.	2.74	1.38	2.48	3.37	2.49		
	Mean humidity.	....	69.9	67	76	71		
	Mean barometer.	30.160	30.165	30.176	30.042	30.136		
	Thermometer. Range.	46.0	50.5	46.0	61.0	50.9		
	Thermometer. Mean.	28.9	38.3	35 7	34.7	34.4	35.04	34.48
November.	Rainfall.	3.40	5.10	2.32	5.40	4.80		
	Mean humidity.	....	63.9	61	68	64.3		
	Mean barometer.	30.099	29.992	30.200	30.107	30.099		
	Thermometer. Range.	42.0	35.0	45.0	54.0	44.0		
	Thermometer. Mean.	41.2	38.3	41.8	39.7	40.2	39.10	44.41
October.	Rainfall	5.20	5.20	2.87	1.42	3.67		
	Mean humidity.	....	63.4	65.0	65	64.5		
	Mean barometer.	30.105	30.073	30.115	30.015	30.077		
	Thermometer. Range.	38.0	43.5	42.0	39.0	40.6		
	Thermometer. Mean.	52.9	54.7	55.5	53.7	54.2	54.25	55.36
September.	Rainfall.	3.66	3.58	6.01	2.53	3.94		
	Mean humidity.	....	70.6	71.0	65	68.9		
	Mean barometer	30.049	30.096	30.100	30.035	30.070		
	Thermometer. Range.	40.	43.0	36.0	45.0	41.0		
	Thermometer. Mean.	67.5	66.1	68.0	64.1	66.4	60.33	66.44
Year.		1872	1873	1874	1875	Mean of 4 years	1875	Mean of 51 years
Authority.		Records of United States Signal Station.					Records of Pennsylvania Hospital.	

(in January) and 97° (in June), equal to a range of 86.5°, less than that of 1875 by 13.5°.

The months which showed the greatest range of temperature in 1875 were December, and next, February; in the first the variations extended through 61°, in the second 58°; those in which the least was experienced, August and July; in the former the range was 27°, in the latter 31°; in 1874 the greatest ranges were observed in February, and next in January, when they equalled respectively 64° and 55°; the least in July and September, when they were not more than 31° and 36°, in the several months. These variations in range follow the general rule for this climate, that the greatest changes in temperature occur in the winter, next in the spring, then in the fall, while the least are found in the summer.

The first frost in the fall of 1875 was noted on the 9th of October.

Pressure.—The mean reading of the barometer for 1875 is 30.059 inches; for 1874, 30.089 inches; the average for four years being 30.059 inches. The highest point reached by the mercury of the barometer during 1875 was 30.787 inches in the month of January, and the lowest 29.361 inches in October, the range of the year being, therefore, 1.426 inches; the greatest monthly range was during December, 1.324 inches. During 1874 the greatest barometric height was recorded in the month of December, 30.834 inches; the lowest in November, 29.163 inches; difference 1.671 inches: the greatest monthly range was during November, 1.565 inches.

Rainfall.—There were noted, during 1875, 40.24

inches of rain and melted snow, which fell on 154 days, against 46.31 inches collected during 1874, in 136 days. There were, therefore, more rainy days during last year than during the previous one, but with less water falling. The months of the two years which differed most in rainfall were the Aprils; there were but 2.85 inches during that month of 1875, while 9.76 inches fell in that of 1874, an excess of nearly 7 inches. The small quantity gathered in the former month gave a dry character to the spring of 1875. More rain fell during August of 1875 than during any other month of that year, 6.42 inches; next in order came November with 5.40 inches. The heavy rainfall of April, 1874, has been already alluded to; the months in the same year most nearly approaching it in respect of quantity were August, during which 5.65 inches were collected, and September, during which the amount recorded was 6.01 inches.

Humidity.—The mean humidity of the atmosphere for 1875 equalled 67° (point of saturation 100°), that for 1874, 65°, though the rainfall, as we have seen above, was greater in the latter than in the former year. The months of greatest humidity in 1875 were August and December, 76° having been recorded for each; in the latter month a thick fog prevailed during 11 days, and 20 days were cloudy. In the year previous, April was the month in which the mean humidity rose highest, reaching 72°; next to it was September with a height of 71°. The lowest point was noted in each year in the month of May, 54° for 1875, and 58° for 1874.

Winds.—The prevailing direction of the wind

during each year was in very large proportion westerly, and chiefly from the southwest.

A brilliant meteor was observed September 28, 1875.

Epidemics.

The epidemiological portion of this report has been made to embrace, in accordance with previous custom, a general view of the whole mortality of the city. The statistics on which it is based were obtained through the kindness of Mr. Geo. E. Chambers, the "Registrar of the Board of Health of the City and Port of Philadelphia," and free use has been made of the report of that board to the mayor, for 1874, exhaustively and carefully prepared by its secretary, Wm. H. Ford, M.D. As these sources of information are available to us only in the shape of bills of mortality, epidemics not directly causing death, should any such have occurred, have escaped notice. To obtain accurate information in this direction would be very difficult. The hospitals and dispensaries do not cover a sufficient field to aid us here, even if their records did not vary from causes not directly connected with the sick-rate, such as changes in the financial condition of the community, and differences in the zeal of individual medical officers; while the recorded experience of a sufficient number of private physicians, to supplement what is lacking from the public institutions, is not readily obtainable in so large and populous a city as Philadelphia. Fortunately such epidemics are of minor importance.

The whole number of deaths recorded in Philadelphia for 1875 is eighteen thousand and eighty-five

(18,085), divided among males and females, 51.21 per cent. of the former to 48.79 per cent. of the latter. Estimating the population of the city at 800,000,[1] this gives a ratio of 22.6 deaths to a thousand persons living, or of 44.42 persons living to one death.

These figures make rather a gloomy contrast with those of the returns for 1874, which show for that year but fifteen thousand two hundred and forty deaths (15,240), a difference of 2845 deaths; or an increase of mortality in 1875 of 19 per cent. Expressed in ratios there were, in 1874, to every thousand living, 19.6 deaths, and 50.86 persons living to one death. If, however, the death-rate of each year be compared with the average rate for the past ten years (1866–1875) 21.6, it will appear that the rate of 1875 is but one per thousand above this mean, while that of 1874 is two less: therefore the latter year was exceptionally healthy, rather than the former sickly to a very unusual degree. The greater death-rate, 22.6, yet remains lower than the mean death-rate of London, "the healthiest large city in the world," which for ten years (1865–1874) equalled 23.7,[2] and falls considerably below that of New York for five years (1870–1874) 29.0,[3] as well as fails to reach that

[1] This estimate may be too large: it is the one adopted by the Board of Health from the First Annual Report of the Bureau of Statistics of Labor and Agriculture of Pennsylvania (page 17). It is calculated on the basis of the average increase in population of the city for the eight decennial periods immediately preceding 1870, which equals 37.48 per cent. In the last of these periods the increase, however, was only 19.18 per cent., though, in the one just before, it somewhat exceeded the average above quoted.

[2] Calculated from the "34th Annual Report of the Registrar-General of Births, Deaths, etc., in England," p. xxxvi.; and the "Annual Summary of Births, Deaths, etc., in London, etc., for 1874," p. ix.

[3] "Sanitary Condition of Boston, 1875," p. 31.

of Boston for ten years (1865–1874) 24.5.[1] On the other hand, if we turn in contrast to rural death-rates, we find that the county of Surrey, in England, gave for ten years (1861–1870) a mean rate of only 18.7,[2] three deaths per thousand less than our average for a like period. Hence, our mean death-rate, though low, is yet much under the control of urban influences.

Of the 18,085 deaths recorded for 1875, 8585 or 47 per cent. took place within the first ten years of life, being distributed as follows: under one year, 4309, or 23 per cent. of all deaths; between one and two years, 1465, or 8 per cent.; between two and five, 1877, or more than 10 per cent.; and between five and ten, 934, or 5 per cent. In 1874, there took place, before the 10 years were reached, 6759 deaths, or 44 per cent. of the total mortality for that year; of these, 4091, or 27 per cent. (of total mortality), occurred under one year of age; 1111, or 7 per cent., between one and two years; 1030, or more than 6 per cent., between two and five; and 527, or 3 per cent., between five and ten years. If the number of deaths under ten years of age in 1874 be subtracted from the corresponding group in 1875, there will remain 1826, which is about two-thirds of the difference in the whole general mortality of the two years; and if the respective parts into which the groups are divided be examined together, it will be seen that the increase in 1875 is greater after the second year, especially between two and five years. The reason for this result will appear in the consideration of the causes of death.

[1] "Sanitary Condition of Boston, 1875," p. 27.

[2] Annual Summary of Births, etc., in London, etc., for 1874, loc. cit.

TABLE C.—COMPARISON OF CLASSIFIED LISTS OF DEATHS IN PHILADELPHIA DURING 1875 AND 1874.

Cause of death.	Year 1875.			Year 1874.		
	Total of class.	Total of order.	Total of species.	Total of class.	Total of order.	Total of species.
I. Zymotic Diseases	4590	....	....	3005	....	....
1. *Miasmatic Diseases*	....	4472	....	....	2903	....
Smallpox	....	....	56	....	....	16
Measles	....	....	12	....	....	117
Scarlatina	....	....	1032	....	....	352
Diphtheria	....	....	656	....	....	181
Croup	....	....	429	....	....	196
Whooping-cough	....	....	125	....	....	74
Typhoid fever	....	....	400	....	....	468
Typhus fever	....	....	21	....	....	26
Diarrhœa	....	....	151	....	....	141
Cholera infantum	....	....	992	....	....	859
Cerebro-spinal meningitis	....	....	83	....	....	80
Other miasmatic diseases	....	....	515	....	....	393
2. *Enthetic Diseases*	....	24	24	....	40	40
3. *Dietetic Diseases*	....	78	78	....	52	52
4. *Parasitic Diseases*	....	16	16	....	10	10
II. Constitutional Diseases	3880	....	....	3680	....	....
1. *Diathetic Diseases*	....	578	....	....	469	....
Cancer	....	....	319	....	....	306
Other diathetic diseases	....	....	259	....	....	163
2. *Tubercular Diseases*	....	3302	....	....	3211	....
Tabes mesenterica	....	....	766	....	....	721
Phthisis pulmonalis	....	....	2359	....	....	2277
Other tubercular diseases	....	....	177	....	....	213
III. Local Diseases	6893	....	....	6009	....	....
1. *Diseases of Nervous System*	....	2619	....	....	2264	....
Cephalitis	....	....	461	....	....	440
Apoplexy	....	....	260	....	....	232
Paralysis	....	....	287	....	....	249
Convulsions	....	....	811	....	....	675
Congestion of brain	....	....	474	....	....	307
Sunstroke	....	....	20	....	....	17
Other dis. of nerv. system	....	....	306	....	....	344
2. *Dis. of Org'ns of Circulat'n*	....	835	....	....	771	....
Pericarditis	....	....	87	....	....	87
Aneurism	....	....	23	....	....	18
Heart diseases	....	....	670	....	....	626
Other dis. of org'ns of circ'n	....	....	55	....	....	40
3. *Dis. of Respiratory Organs*	....	1927	....	....	1688	....
Bronchitis	....	....	342	....	....	256
Pleurisy	....	....	104	....	....	82
Pneumonia	....	....	1085	....	....	943
Congestion of lungs	....	....	192	....	....	190
Other dis. of resp. organs	....	....	204	....	....	217

TABLE C—*continued.*

Cause of death.	Year 1875.			Year 1874.		
	Total of class.	Total of order.	Total of species.	Total of class.	Total of order.	Total of species.
4. *Dis. of Digestive Organs*	....	1023	....	....	907	....
Enteritis	....	....	399	....	....	336
Peritonitis	....	....	159	....	....	119
Intestine diseases	....	....	150	....	....	120
Stomach diseases	....	....	29	....	....	37
Liver diseases	....	....	219	....	....	227
Other dis. of digest. organs	...	....	67	....	....	68
5. *Diseases of Urinary Organs*	....	367	....	....	273	....
Nephritis	....	....	47	....	....	24
Bright's disease	....	....	195	....	....	131
Other dis. of urinary organs	....	....	125	....	....	118
6. *Dis. of Org'ns of Generat'n*	....	57	....	....	60	....
Diseases of ovaries	....	....	13	....	....	16
Uterine diseases	....	....	44	....	....	44
7. *Dis. of Org'ns of Locomot'n*	....	24	....	....	20	....
Caries and necrosis	....	....	12	....	....	10
Joint diseases	....	....	12	....	....	10
8. *Dis. of Integumentary Syst.*	....	41	41	....	26	26
IV. Developmental Diseases	2021	....	....	1891	....	....
1. *Devel. diseases of Children*	....	436	....	....	391	....
Premature birth	....	....	280	....	....	229
Malformations	....	....	120	....	....	123
Teething	....	....	36	....	....	39
2. *Develop. diseases of Adults*	....	34	....	....	41	....
Childbirth	....	....	10	....	....	16
Puerperal convulsions	....	....	24	....	....	23
Chlorosis	....	....	....	....	....	2
3. *Develop. dis. of O'd People*	....	492	....	....	433	....
Old age	....	....	492	....	....	433
4. *Diseases of Nutrition*	....	1059	....	....	1026	....
Debility	....	....	695	....	....	712
Inanition	....	....	364	....	....	314
V. Violent Deaths	648	....	....	606	....	....
1. *Accident and Negligence*	....	553	....	....	528	....
Drowning	....	....	119	....	....	129
Otherwise	....	....	434	....	....	399
2.	....	....	....	....	....	....
3. *Homicide*	....	27	27	....	19	19
4. *Suicide*	....	68	68	....	59	59
Causes not Specified	53	53	53	49	49	49
	18,085	18,085	18,085	15,240	15,240	15,240

Consulting Table C, an abstract of the causes of death in 1875 and 1874, arranged according to the classification of Dr. Farr, an excess of mortality is observed in 1875, in all the classes of disease, and, with insignificant exceptions, in all the orders. This suggests the exaggerated action of some general morbific cause. But the excess is found to be not evenly distributed among the classes, the ratios of increase being, for zymotic diseases, 53 per cent.; for constitutional, 5 per cent.; for local, 11 per cent.; and for developmental, and for violent deaths, each, 7 per cent.; this overwhelming advance in the zymotics compared with that in the other classes calls attention then, on the other hand, to the special factor of epidemic influence. This, the prominent subject of this report, will now be considered.

The whole difference in the number of deaths in the zymotic class equals 1585, or 56 per cent. of the whole increase in the general mortality, the first order (miasmatic diseases) contributing 1569 of this amount. Selecting for comparison eight diseases of this order, it is found that in 1875 the deaths from smallpox were increased by 40, those from scarlet fever by 680, those from diphtheria by 475, those from croup by 233, those from whooping-cough by 51, and those from cholera infantum by 133, while those from measles declined 105 (the disease almost disappearing from the list), and those from typhoid fever 68. Thus, the three diseases, scarlet fever, diphtheria, and croup, were responsible for an excess of 1388 deaths, 88 per cent. of the whole zymotic increase, and rank as the prevailing epidemics of 1875,

the position held, to a certain degree, by measles in the previous year.

To appreciate the course of five of the most interesting of the above diseases, Table D has been constructed, which shows their special degrees of prevalence during the several months of 1875, in conjunction with the extent to which they individually invaded the different wards of the city.

From this table it is seen that the deaths from *small-pox* were, 0 in January, 1 in February, 5 in March, 5 in April, 1 in May, 2 in June, 1 in July, 7 in August, 2 in September, 3 in October, 8 in November, and 21 in December; the last month furnishing nearly half of the whole number. This is the first annual increase of this disease since the great epidemic of 1871–1872; its recognition should urge us to increased activity in extending the precious prophylactic of vaccination, but the number of deaths is fortunately still too small to occasion grave apprehension of a severe recurrence of the dreaded scourge, especially since they were distributed through more than one-half of the city wards. The largest number of deaths that took place in any one ward occurred in the second, in all fifteen; 1 in July, 6 in August, 2 in September, 1 in October, 3 in November, and 2 in December; if an inference may be drawn from such small numbers, it would be favorable to the decline of the pest in that ward. The 21 deaths of December were divided among twelve wards, not entirely adjacent; one group, formed by the first, second, fourth, and twenty-fifth, embracing the southern section of the city, contributed 8 of these.

TABLE D.—DISTRIBUTION OF THE EPIDEMIC DISEASES SMALLPOX, SCARLATINA, DIPHTHERIA, CROUP, AND TYPHOID FEVER, AMONG THE SEVERAL WARDS OF PHILADELPHIA IN 1875, DURING EACH MONTH, AND FOR THE YEAR.

Number of ward.	January.					February.					March.					April.					May.					June.					July.					August.				
	Smallpox.	Scarlatina.	Diphtheria.	Croup.	Typh'd fev.	Smallpox.	Scarlatina.	Diphtheria.	Croup.	Typh'd fev.	Smallpox.	Scarlatina.	Diphtheria.	Croup.	Typh'd fev.	Smallpox.	Scarlatina.	Diphtheria.	Croup.	Typh'd fev.	Smallpox.	Scarlatina.	Diphtheria.	Croup.	Typh'd fev.	Smallpox.	Scarlatina.	Diphtheria.	Croup.	Typh'd fev.	Smallpox.	Scarlatina.	Diphtheria.	Croup.	Typh'd fev.	Smallpox.	Scarlatina.	Diphtheria.	Croup.	Typh'd fev.
1st	..	12	3	12	..	..	8	2	6	1	..	11	2	6	3	..	12	4	1	..	..	9	4	2	..	..	11	2	..	..	..	7	2	1	4	..	3	1	4	1
2d	..	9	3	4	1	..	6	2	1	..	..	11	2	..	..	..	6	3	1	1	..	6	1	1	1	..	12	..	3	..	1	1	1	1	1	6	1	2	..	2
3d	..	7	..	1	..	..	5	..	1	2	..	2	2	2	1	..	2	3	1	1	..	4	1	1	..	..	6	1	..	1	..	3	..	..	..	..	..	..	..	2
4th	..	6	..	6	..	..	9	..	1	2	..	8	1	1	3	..	8	..	..	..	..	3	1	..	1	..	2	2	2	..	..	2	..	2	1	..	3	3	..	1
5th	..	4	1	.	..	..	3	..	..	..	..	2	2	..	..	..	2	2	..	2	..	2	4	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
6th	..	2	1	1	1	1	3	1	1	..	..	1	..	..	1	..	1	..	1	..	..	1	1	..	1	..	4	5	..	1	..	..	1	..	..	..	..	1	..	..
7th	..	1	..	1	1	..	3	2	1	3	..	1	2	1	..	..	1	1	3	..	..	1	..	1	..	..	7	3	..	1	..	2	..	..	1	..	..	..	..	1
8th	..	1	1	..	1	..	1	..	..	1	..	2	1	1	1	..	..	1	..	..	..	1	3	..	3	..	..	3	1	..	..	2	..	..	..	..	3	..	..
9th	..	..	..	..	..	..	..	1	1	..	..	2	2	1	..	..	1	2	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
10th	..	1	3	1	..	..	1	2	..	..	..	4	..	..	..	..	2	2	..	1	..	..	..	..	..	..	1	1	4	..	..	1	..	1	2	1	1	1	..	3
11th	..	2	..	1	..	..	..	2	1	1	..	..	1	1	..	2	1	2	..	..	1	3	..	..	..	..	3	2	1	1	..	5	1	..	..	..	1	2	..	1
12th	..	1	3	4	1	..	1	..	2	..	..	1	1	2	1	..	3	..	..	1	..	5	..	1	..	..	4	1	1	..	..	1	1	..	1	..	..	1	..	1
13th	..	2	1	3	1	..	1	1	..	1	..	5	1	1	1	..	2	2	..	..	..	5	1	1	1	..	6	3	1	1	..	1	1	..	..	..	..	1	2
14th	..	2	2	2	..	..	..	..	..	..	1	4	..	..	..	..	2	1	2	..	..	2	2	..	1	..	2	1	..	..	..	3	1	..	1	..	3	..	1	1
15th	..	1	1	..	1	..	2	2	2	1	..	3	4	4	..	..	2	2	1	..	..	2	2	1	..	..	11	2	1	..	..	3	3	..	1	..	4	4	1	..
16th	..	1	1	1	..	..	2	2	5	..	..	6	5	3	2	1	1	1	2	1	..	3	5	1	3	..	9	5	2	..	..	5	4	..	..	..	2	4	..	1
17th	..	3	3	2	2	..	..	2	3	1	..	4	..	2	..	..	11	4	1	..	..	3	..	1	..	..	7	1	1	1	..	8	..	1	1	..	3	1	..	1
18th	..	5	1	1	2	..	..	1	..	3	..	3	1	2	4	..	4	..	2	1	..	1	1	..	3	..	9	..	1	2	..	3	1	..	1	..	7	..	1	..
19th	..	11	2	4	6	..	8	2	3	7	..	9	4	2	9	..	11	1	3	3	..	15	5	2	6	..	21	3	4	9	..	9	5	3	1	..	5	6	1	10
20th	..	2	1	3	2	..	3	2	1	2	..	13	3	2	2	..	7	..	..	3	..	6	1	2	1	..	18	4	2	3	..	11	..	1	1	..	6	..	..	3
21st	..	1	..	1	..	..	..	..	2	..	..	..	1	2	..	..	4	1	1	..	..	2	..	1	..	..	6	21	10	1	..	3	8	5	..	..	..	13	3	..
22d	..	9	2	1	1	..	12	..	..	..	..	11	4	2	2	..	11	3	1	..	..	6	2	1	..	..	4	1	1	1	..	..	2	..	..	..	..	1	..	2
23d	..	..	..	..	3	..	4	..	..	1	..	9	..	..	2	..	6	..	..	2	..	8	..	2	1	..	5	1	3	2	..	3	3	3	..	..	2	5	..	4
24th	..	1	7	1	1	..	3	2	..	..	..	9	3	2	2	..	3	3	..	1	..	2	2	..	1	..	2	..	..	2	..	1	1	..	..	..	1	..	..	2
25th	..	..	..	2	1	..	..	..	1	..	..	1	1	..	2	..	2	1	1	1	..	1	..	..	..	..	2	..	..	2	..	..	3	1	..	..	2	..	..	1
26th	..	12	4	1	3	..	8	..	..	..	..	11	4	..	1	..	9	5	1	..	..	5	7	2	..	..	8	1	..	1	..	10	4	..	5	..	10	7	2	3
27th	..	4	..	..	1	..	2	..	2	2	.	2	..	1	1	..	1	..	1	1	..	1	..	2	..	..	1	1	..	..	..	1	1	..	2	..	1	..	..	..
28th	..	2	..	..	3	..	2	..	1	1	.4	7	..	..	1	2	2	..	..	..	..	1	1	..	1	2	2	1	..	..	..	2	..	1	..	..	4	1	..	2
29th	..	..	1	4	1	..	2	1	4	1	..	7	1	..	..	..	4	3	1	1	..	5	2	1	..	..	8	..	..	3	..	..	..	..	1	..	4	1	..	4
	0	102	41	57	33	1	89	27	39	30	5	149	48	38	39	5	121	47	24	20	1	104	46	23	25	2	171	65	38	30	1	87	45	20	24	7	63	57	14	48

TABLE D—*continued.*

Number of ward.	September.					October.					November.					December.					For the year.					Population, census of 1870.	Area in square miles.
	Smallpox.	Scarlatina.	Diphtheria.	Croup.	Typh'd fev	Smallpox.	Scarlatina.	Diphtheria.	Croup.	Typh'd fev	Smallpox.	Scarlatina	Diphtheria	Croup.	Typh'd fev	Smallpox	Scarlatina.	Diphtheria.	Croup.	Typh'd fev.	Smallpox.	Scarlatina	Diphtheria.	Croup.	Typh'd fev		
1st	..	2	4	2	5	5	..	1	3	4	..	1	2	1	2	..	2	5	3	2	1	3	83	31	45	15	25,817	5.509
2d	2	1	2	2	2	2	1	2	1	2	3	3	1	2	4	..	2	..	3	..	1	15	56	22	19	12	30,220	.442
3d	..	..	..	..	1	..	..	1	1	2	..	..	..	1	..	..	1	..	2	1	..		30	8	10	11	19.149	.191
4th	..	1	1	..	1	..	1	1	1	2	..	..	3	2	..	1	..	4	1	1	1		43	16	16	12	20,852	.229
5th	..	..	..	..	1	..	..	4	1	2	..	..	3	1	1	..	..	2	2	1	..		13	17	4	8	18.736	.321
6th	..	..	..	..	..	..	..	1	1	1	..	..	..	2	..	..	..	1	..	1	1		12	12	6	6	12,064	.321
7th	..	..	..	..	1	..	..	3	1	1	..	..	3	1	2	..	1	1	..	..	..		17	15	9	11	31,558	.439
8th	..	..	..	1	..	..	..	..	..	..	..	..	1	..	1	..	..	1	..	..	..		7	14	3	7	22,286	.435
9th	..	..	..	..	1	..	..	1	..	..	..	1	..	..	2	..	..	..	..	1	..		5	7	2	4	16,629	.400
10th	..	..	1	..	..	..	1	..	1	..	..	..	2	..	..	2	1	2	4	1	3		13	14	11	7	23,312	.359
11th	..	..	1	1	1	..	1	5	1	..	..	..	1	..	..	1	2	3	1	1	1		18	20	7	5	14,845	.210
12th	..	..	..	1	1	..	5	..	3	2	..	..	1	..	..	..	2	2	2	..	..		23	10	16	8	15,771	.193
13th	..	..	1	2	1	..	2	2	1	1	..	1	5	..	..	..	2	2	..	1	..		27	20	10	10	19,956	.251
14th	..	..	..	..	2	..	1	4	1	3	..	..	3	1	..	3	..	4	1	..	4		19	18	8	8	22,643	.237
15th	..	1	5	1	..	..	1	7	1	1	..	..	7	1	..	..	6	6	5	3	1		36	45	18	7	44,659	1,049
16th	..	1	1	1	..	1	1	..	1	..	..	..	2	1	..	..	2	..	1	..	1		31	31	18	7	19,256	.281
17th	..	..	1	3	1	..	1	2	..	..	..	..	2	2	..	1	..	..	..	3	1		42	16	16	10	21,347	.251
18th	..	8	1	..	3	..	1	..	..	3	..	9	..	1	1	..	1	5	4	3	..		51	11	12	26	26.366	.650
19th	..	7	4	1	5	..	7	5	3	3	..	6	2	7	2	1	5	4	7	11	1		114	43	40	72	45.240	1.455
20th	..	..	..	2	1	..	1	2	..	2	..	1	3	2	3	..	1	8	4	9	..		69	21	19	32	56,642[1]	.734
21st	..	..	5	3	..	..	2	10	3	2	..	..	1	5	..	..	2	12	2	1	..		20	72	38	4	13,861	7.129
22d	..	..	2	1	2	..	..	..	1	..	..	1	3	..	4	..	1	..	2	1	..		55	20	10	13	22,605	18.114
23d	..	..	1	..	3	..	..	4	2	3	1	3	..	2	1	..	1	1	1	1	1		41	15	13	23	20,888	42.716
24th	..	..	3	1	2	..	1	3	2	..	..	3	4	1	1	..	1	4	2	2	..		27	33	9	14	24,932	9.725
25th	..	7	2	3	..	..	..	5	4	..	..	1	4	5	1	2	7	10	2	..	2		23	26	19	6	18,639	13.660
26th	..	2	6	4	1	1	3	8	2	1	..	1	6	2	4	3	6	7	5	..	4		85	59	19	19	36,603	8.000
27th	..	..	..	..	1	..	..	1	1	1	..	2	1	1	4	..	1	..	..	2	..		16	4	8	15	19,385	11.680
28th	..	..	..	..	1	..	..	2	5	..	3	..	2	..	2	2	3	7	2	2	13		25	14	9	13	10,370	6.343
29th	..	..	1	1	1	..	1	1	..	..	..	..	3	3	1	1	..	5	1	2	1		31	19	15	15	([1])	1.400
	2	30	42	33	38	3	33	76	43	33	8	32	65	17	30	21	51	97	53	50	56		1032	656	429	400	671,022	129.379

[1] The population of the 29th ward is included with that of the 20th.

Scarlatina has been credited with 1032 deaths; they occurred, in January 102, in February 89, in March 149, in April 121, in May 104, in June 171, in July 87, in August 63, in September 30, in October 33, in November 32, in December 31. This is about three times the number of deaths recorded for the previous year, and the most for any year since 1861; it gives about the same rate of mortality as occurred in 1870, since which year the disease had been steadily on the decline till the last quarter of 1874, when this recent epidemic began to be manifest; noting the mortality of the several months, quoted above, the malady is seen to be again decidedly on the decrease.

Though there were some deaths from scarlet fever in every ward of the city, yet the number in the several wards varied very much, from 114, the highest number, in the nineteenth, to 5, the lowest, in the ninth. In the first, second, fourth, and twenty-fifth wards, the group in which were the most deaths from smallpox at the close of the year, 277 deaths occurred from scarlet fever, more than one-fourth of its whole mortality, falling especially in the earlier months. One-fifth of the deaths were returned from another group of wards, the seventeenth, eighteenth, and nineteenth. These two groups contained respectively, according to the census, in 1870, 113,492 and 92,953 inhabitants, so that they were visited by the epidemic to the extent of twice the ratio for the whole city. These sections are the favorite seats of zymotic disease among us. The first embraces the low lands which stretch out to the south into the "neck;" distant from the centres of wealth it makes

the home of many poor and destitute, a class in which early marriages bring many children and ignorance causes disregard of hygiene. The second group occupies a somewhat similar position; situated to the north of the old "city proper," it extends along the river Delaware, having a small stream (Gunners' Run) running through it, the waters of which mingle with those of the river in the neighborhood of the water pipe which brings the water supply to that section of the city.

Equally high death-rates are shown by the twenty-second and twenty-third wards, which comprise respectively what were formerly the independent towns of Germantown and Frankford. These places still retain, in many respects, their individuality, the spaces between them and the city being yet but sparsely built up; they thus present instances of the law that small towns are apt to be more severely attacked by epidemic diseases than large ones.

The want of aggressive power in our ideas of prevention of disease, is in nothing more conspicuous than in the endemic and occasional epidemic prevalence of scarlet fever; for the means of "stamping it out," to use the expressive term of Simpson, in writing of smallpox, lie to a great extent within our grasp and yet remain comparatively idle. However it may be that some forms of zymotic disease appear occasionally to arise sporadically, scarlet fever has almost invariably been traced, in communities previously entirely exempt, to personal communion of the infected; while experiments are not wanting to prove that a moderate dry heat (212° Fahr.) can

destroy the activity of the unseen contagium,[1] which, moreover, possesses so little diffusive power as to make the supposition that it exists in a solid form extremely probable. Isolation of patients, and the judicious use of heat ought then to accomplish the destruction of this enemy. And isolation of scarlet fever patients should be comparatively easy; for they, being almost entirely young children, are completely under parental control, while, on the other hand, the insusceptibility of grown persons to the disease permits, to the sick, attendants who, with the exercise of but little care, will not themselves become new foci of contagion.

There were classed from *diphtheria* 656 deaths, more than three and a half times as many as for the previous year; over one-half the deaths of that year occurring during the last quarter. This is the largest number reported for any year since 1861, the year after the new appearance of diphtheria in Philadelphia, when there were recorded 502 deaths among a population of 577,000; since that period the number of deaths with some unimportant exceptions had been steadily on the decline, diminishing in 1873 to 110.

In the first quarter of the year, 116 deaths occurred, less than the 181 in the last quarter of 1874, but there was an increase in the second quarter to 158, a slight diminution in the third to 144, but a rise again in the last quarter to 238, more than double the figures of the first, the month of December furnishing 97 deaths. The disease, though existent in all the wards

[1] Experiments of Henry; referred to by Louis Thomas in "Ziemssen's Cyclop. Pract. Med.," Art. "Scarlet Fever," vol. ii. p. 167. New York, 1875.

of the city, was especially fatal in the twenty-first, which comprises the manufacturing town of Manayunk: in a population which numbered 13,861 in 1870, there occurred last year 72 deaths, about one-ninth of all reported for the city, and six times the average ratio for each of the wards. The deaths took place in this ward, in chronological order, in March, 1; in April, 1; in June, 21; in July, 8; in August, 13; in September, 5; in October, 10; in November, 1; in December, 12. Diphtheria then ran a seemingly capricious course, but, in the whole city, was rather increasing at the close of the year.

The deaths from *croup* in 1875 were double the average for the last few years, but not greatly in excess of the mean for the last thirty years; they were distributed through all the city wards, but, like scarlet fever and diphtheria, unequally. The wards most severely visited were the twenty-first (the same in which diphtheria was most fatal) and the first. The mortality of the disease bore generally an inverse ratio to the degree of atmospheric temperature, 134 and 143 deaths taking place in the first and fourth quarters respectively, while 85 occurred in the second, and 67 in the third quarter.

The victims of *typhoid fever* decreased, as seen above, 17 per cent. This disease was less fatal in the better drained and well built wards of the old "city proper" and on the high ground of the fifteenth ward, to the northwest; it had its greatest sway in the nineteenth and eighteenth wards, parts of an unfortunate district before referred to in connection with the deaths from scarlet fever; the outlying twenty-third (Frankford), twenty-seventh, and

twenty-eighth wards also gave each a higher death-rate than that for the whole city. December and August were charged with the most deaths, 50 occurring in the former and 48 in the latter month; in April the least number was recorded, 20.

The deaths from *cholera infantum*, notwithstanding the increase over the previous year, were not excessive in number: the whole increase was equalled by an excess in the month of June, due especially to the immediate succession of five hot days (24th–28th, average temp. 83°), in which the relative humidity of the atmosphere was generally high.

Nearly one-seventh, 17, of the deaths from *whooping cough* took place in the twenty-fourth ward (West Philadelphia), the population of which in 1870 was only one twenty-seventh that of the whole city.

Reviewing the general course of the zymotics as briefly traced above, it appears that no one of them took a great hold on any special locality, though there was a tendency to aggregation in certain places of the deaths from each: also that the haunts especially sought were away from the centre of the city, notably in the adjacent towns. Conditions of soil, peculiarity of age distribution, and neglect of hygiene, have been already alluded to in connection with certain of these districts. Besides their acknowledged influence in determining the zymotic death-rate, there may be cited as having some effect, the mode of living in common and the habit of frequent change of residence, which prevail among the class of people chiefly inhabiting these sections: the former brings proportionately more individuals in contact with the sick, and the latter exposes many families in suc-

cession to the influence of infected rooms. Frequent intercourse among a limited number of persons is a disturbing element in small towns.

The prevalence of diphtheria with scarlatina and croup, in view of the fact that it has at times been considered identical with each, is very interesting; since it has some features readily confounded with those of each, no doubt numerous mistakes in diagnosis have occurred in the reporting of deaths, and the precise relations of the three diseases during last year do not appear in the above report. Yet the results that scarlet fever is decidedly declining, while diphtheria is increasing, and croup about keeping the average for the year, in conjunction with the greater prevalence of the first disease in Germantown, of the second in Manayunk, and the third in the first ward (where diphtheria was not in excess) —these things show that there are main specific differences in the diseases, which in the majority of cases do not escape recognition. The greater mortality of these diseases in this climate among children between two and five years, explains the greater number of deaths recorded as occurring in the general returns during that period of life in 1875.

The smaller increase of mortality in 1875 due to other than epidemic influence was, as we have seen, widely distributed among the several classes of disease: it presents no points of sufficient interest to warrant an extension of the limits of this report in their examination.

There were 824 still-births in 1875: this is a smaller number than the records of the previous year give, 891.

NOTE.

The allusion on page 78 to Prof. Sayre's views has reference to the report of a Clinical Lecture by that surgeon, published in the Philadelphia Medical Times for April 11, 1874.

I think it but right to say that after these pages were printed, and on reading an abstract of my paper in the Medical and Surgical Reporter for April 22, 1876, Prof. Sayre addressed a letter to that journal, expressing his assent to the doctrines herein advanced, and avowing his belief in the value of constitutional treatment in cases of chronic joint disease.

J. A., Jr.

ON THE

OPERATIVE AND CONSERVATIVE SURGERY OF THE LARGER JOINTS.

II. Excision of the Knee and Amputation of the Thigh for Disease of the Knee-Joint.

By

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[Read March 1, 1876.]

In accordance with the intention announced in a paper on Excision of the Elbow, which I had the honor of reading before the College rather more than a year ago, I purpose, on the present occasion, to communicate the results of my individual experience in the operative and conservative treatment of disease of the knee-joint. In doing this I shall first briefly narrate the cases, ten in number, in which I have had occasion to excise this articulation; I shall then add an account of five cases in which from various reasons I have felt compelled to resort to amputation rather than excision; and shall in conclusion refer to the conditions which in my judgment require the abandonment of expectant measures in the treatment of disease of this joint, and the considerations which should guide the surgeon in deciding upon the particular operation to be employed. I shall also refer

to some points in connection with the various steps of the operation of excision, and the mode of after-treatment which I believe to be most satisfactory.

Case I. *Partial Anchylosis with Recurrent Arthritis of Right Knee; Excision; Recovery with Useful Limb.*—The portions of bone removed in this case were exhibited in their recent state to the Pathological Society, at its meeting of March 24, 1870, and a brief note of the case has appeared in the proceedings of that body (vol. iii. p. 164). The patient was a boy, ten years of age, who four years previously had received an injury of the right knee, and had been subsequently treated in various hospitals with but temporary benefit. When admitted to the Episcopal Hospital, where he came under my observation, in March, 1870, the joint was found to be markedly distorted, the limb being contracted to an angle of about 120°, the tibia dislocated backwards and upwards, and the patella firmly fixed upon the external condyle of the femur. There was partial anchylosis; the joint was tender and at times painful; and the frequent falls to which the boy was exposed by the inability to use his limb, led to oft-recurring attacks of inflammation, each of which left the part more crippled than it had been before.

Under these circumstances it was determined to resort to excision, and accordingly, on March 23, the patient being under the anæsthetic influence of ether, I made a single curved incision over the front of the joint, dissected out the patella, and, having with a probe-pointed knife fairly exposed the ends of the femur and tibia, removed their articulating extremities with the saw known as "Butcher's," its blade being fixed so as to cut from below upwards, and thus to avoid all risk of injury to the important structures in the popliteal space. The disorganized soft tissues of the joint having then been clipped away with Butcher's knife-bladed forceps, a few small vessels were secured with ligatures, the edges of the wound were brought together with numerous points of the interupted wire suture, and, the resected bones

having been carefully adjusted, the limb was firmly fixed upon a well-padded, posterior, bracketed splint (which will be more particularly described hereafter), the wound lightly dressed, and the patient restored to bed.

But little need be said as to the subsequent progress of the case; the wound was dressed daily, but the limb was not taken from the splint until cleanliness required its removal, and then the parts were firmly held by an assistant until the padding of the splint had been renewed, when everything was readjusted as before. When the union of the resected portions was sufficiently advanced, the bracketed splint was exchanged for a simple moulded pasteboard gutter, and this

Fig. 1.

Fig. 2.

in turn was ultimately replaced by a soap plaster and bandage. The greater part of the wound healed by adhesion, and on August 18, 1870 (nearly five months from the date of operation), the patient was quite well, his leg firmly united

at a slight angle, and able to walk without crutch, cane, or other assistance, and with no pain. The shortening of the limb was noted as two and three-quarters inches, but part of this was the result of a fracture of the thigh which had been received some years before.

The appearances of the excised portions of bone, showing ulceration of the articular cartilages with erosion of the subjacent osseous tissue, may be seen in Figs. 1 and 2. The condition of the patient before and after operation is shown in Figs. 3 and 4.

Fig. 3.

Fig. 4.

The above case is a fair example of a large number met with in practice, particularly amid the class of patients by whom our hospitals are chiefly filled. A stiff knee-joint, by itself, can seldom be thought to require so serious an operation as excision, the deformity being usually remediable by milder measures. But

when imperfect anchylosis, in a bad position, is complicated by the frequent recurrence of arthritis, the case (provided that there be no contra-indication in the age and general condition of the patient) is one in which little or no benefit can be hoped for without operation, and in which excision may be resorted to with every prospect of a favorable result.

Case II. *Arthritis of Knee of Six Years' Standing; Limb Deformed and Useless; Excision; Recovery with Useful Limb.*—The patient in this case was presented at a meeting of the College held on Feb. 21, 1872, and a note of the case appeared in the Transactions (vol. iv. 2d S., page 413). The patient, Mary M., eleven years of age, was admitted to the Episcopal Hospital on Feb. 24, 1871. At the age of five, she had suffered from smallpox, following which disease she had arthritis of both elbows and of the right knee. In the elbows, firm anchylosis ensued, and the joints being flexed at convenient angles, she enjoyed very good use of her upper limbs. In the knee, however, the arthritis recurred from time to time (the last acute attack having been about two months before the date of the patient's entrance to the hospital), and the appearance of the joint, on her admission, was quite characteristic of advanced disease of the articulation. The knee was flexed to a right angle and much swollen, the subcutaneous veins enlarged, and the tibia dislocated backwards and outwards. The joint was tender on pressure and painful when moved, and the patient thin and anæmic.

Excision was performed on Feb. 28, 1871, a single transverse incision affording access to the joint; the parts removed were the condyles of the femur, the articulating surface of the tibia, and the patella. Five or six small vessels were secured with ligatures, the wound closed with wire sutures and lightly dressed with oiled lint, and the limb carefully adjusted upon the bracketed splint, which was not changed until some time in the fourth week.

Convalescence was retarded by a profuse epistaxis which occurred a few days after the operation, leaving the patient blanched and exhausted, by rather profuse suppuration (several abscesses having formed above the site of excision), and by a troublesome diarrhœa which beginning in the month of April continued at intervals through the summer, and at one time became a really serious complication. Firm bony union was completed about the third or fourth month, but several superficial sinuses persisted, and did not entirely heal until several months later. A year after the operation the patient walked readily, without any assistance whatever, though with a perceptible limp due to the shortening, which

Fig. 5.

Fig. 6.

was found by measurement to be an inch and three-quarters. She had grown considerably, was fat and hearty, and in every way offered satisfactory evidence of the advantages to

be derived from this particular branch of conservative surgery. This patient has been frequently seen since her discharge from hospital, and it has been ascertained that the benefits derived from the operation have been permanent.

The accompanying illustrations (Figs. 5 and 6), from photographs, show the appearance of the patient before operation and after recovery.

In the next case, the disease, though of shorter duration, had run a more acute course, the joint having suppurated, and being open at the time of the operation.

Case III. *Excision of Right Knee for Chronic Arthritis with Intra-articular Abscess; Recovery with Useful Limb.*—The subject of this case, Henry S——, was a young man, eighteen years of age, who entered the Episcopal Hospital on January 4, 1872. He had been suffering from disease of the right knee-joint for one year, during the last three months of which the articulation had been suppurating and discharging externally. The joint was greatly swollen, and the surrounding soft parts much infiltrated with the products of inflammation, but as the diseased action seemed to be limited to the articulation itself, and as the patient's general condition was satisfactory, it was thought proper to make an attempt to save the limb by excision.

Accordingly, on January 11, 1872, the patient being thoroughly etherized, the joint was laid open by a single transverse incision below the patella, when this bone was removed together with the articulating extremities of the femur and tibia, the articular cartilages on both of the latter being found to have been almost entirely destroyed. But two ligatures were required, and the wound having been closed with wire sutures and dressed with oiled lint, the limb was carefully adjusted on a posterior bracketed splint in the usual way. The greater portion of the wound united by adhesion, and though convalescence was delayed by the formation of

several superficial abscesses, the progress of the case was upon the whole satisfactory.

In January, 1873, one year after the operation, the patient walked with crutches, without any support to the resected limb, which was an inch and a half shorter than its fellow. There was still slight motion of flexion and extension at the knee, but no lateral movement whatever. There were two or three small sinuses, with superficial caries, but not connected with the site of excision. On January 21, the patient fell and sustained a fracture of the fibula of the resected limb, but did not injure the knee, thus furnishing a pretty good test of the sufficiency of the repair which had taken place. This accident was recovered from in a few weeks, and by March 25, the patient walked with a single crutch; on April 30, the sinuses were nearly healed, and he walked readily with a cane, and for short distances without even that

Fig. 7.

support; and on May 4, he was made an out-patient. I have heard from him since at intervals, the last time a few months ago; his limb has long been healed, and he walks readily

with a cane; he supports himself by peddling vegetables from a cart, and comes to town twice a week to go to the theatre.

The appearance of the resected limb is shown in the annexed illustration, from a drawing by Dr. Martinez. (Fig. 7.)

Though I have always endeavored to secure bony union after excision of the knee-joint (believing it to be safer to do so), yet I have in two cases succeeded in obtaining very useful limbs, while slight motion still remained in the direction of flexion and extension; indeed, provided that there be no lateral movement, such a result is by no means disadvantageous, the slight yielding of the limb antero-posteriorly enabling the patient, I think, to walk with a less apparent limp than if the part is entirely immovable.

Case IV. *Arthritis of Left Knee, the result of Injury; Abscess communicating with Joint; Excision; Rapid Recovery with Useful Limb.*—James H——, a boy nine years of age, was admitted to the Episcopal Hospital on Nov. 16, 1871, suffering from an "injury"—probably a contusion—of the knee, which was followed by arthritis, and by the formation of an abscess in the thigh, immediately above the joint, with which it subsequently communicated. This abscess had been opened in December, and in January, 1872, when I took charge of the case, I found the parts in a quiet condition, but the ligaments of the joint very much relaxed, and its structure evidently disorganized. Excision was performed in the usual way on January 25, the semilunar cartilages being found much diseased, though the articular surfaces of the femur and tibia were but slightly eroded. Only one ligature was required, and the limb was placed on a bracketed splint and dressed in the usual manner. The patient convalesced rapidly; osseous union occurred quickly between the resected bones: and the patient was discharged, cured, with an excellent limb, on June 12, 1872, about four and a half months

after the date of excision. The result of the operation may be seen by the accompanying illustration (Fig. 8), from a photograph taken shortly before the patient left the Hospital.

Fig. 8.

In the next case, as in that of Henry S——, a most useful limb was obtained, although without the occurrence of bony union.

Case V. *Excision of Left Knee-Joint for Arthritis of Two Years' Standing; Recovery with Useful Limb.* — Annie Mc S——, nine years of age, entered the Children's Hospital on October 8, 1873, suffering from arthritis of the left knee, with partial anchylosis, and consecutive outward and backward dislocation of the tibia. The condition of her limb rendered her very helpless, and by preventing her from going to school seriously interfered with her acquiring an education.

As her disease, moreover, was of two years' standing, and was manifestly too far advanced to offer much prospect of recovery without operation, immediate excision was determined upon, and was performed in the usual way on Oct. 14, 1873, only one ligature being required, and the wound being dressed and the limb supported in the ordinary manner. The articular cartilages were found much eroded, and a patch of caries existed on the outer condyle of the femur. The appearances of the resected parts are seen in the annexed illustrations (Figs. 9 and 10).

Fig. 9.

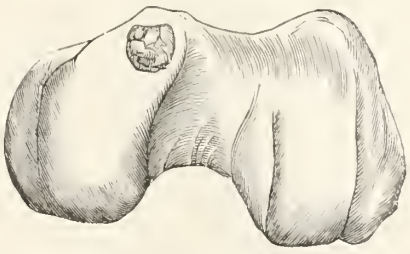


Fig. 10.

The operation was followed by very little constitutional disturbance; an abscess, which formed above the excision wound, was opened on Oct. 18; the sutures were removed on the 20th, and the ligature came away on the day following. Union between the resected surfaces had begun by Oct. 26, and by Dec. 12, the cure was sufficiently far advanced to allow the bracketed splint to be replaced by a simple moulded pasteboard gutter, and the patient to sit up. By March, 1874, though slight motion still existed as regarded flexion and extension, the patient was able to walk without any aid, the

limb being simply supported with a soap-plaster and bandage. One superficial sinus, which healed very slowly, caused the patient to be kept under observation an unusually long time, and she did not finally leave the Hospital until the summer of 1875 (nearly twenty months after the operation), previous to which she was presented at a meeting of the College, and a photograph was secured, from which the annexed illustration (Fig. 11) is taken.

Fig. 11.

The case which follows is an example of that form of disease for which I have ventured to propose the name of *Gelatinous Arthritis*, and by its long duration, and long period of convalescence after operation, permits us to see one reason why so many surgeons have,

in these joint affections, preferred the ready method of amputation to the more conservative but more tedious mode of treatment by excision.

Case VI. *Gelatinous Arthritis of Three Years' Duration; Excision; Recovery with Useful Limb.*—Rose U., eight years of age, was admitted to the Episcopal Hospital on March 25, 1874, suffering from gelatinous arthritis of the right knee, the disease having existed since her fifth year. She had been for a time a patient in the Orthopædic Hospital. Excision by the usual transverse incision was performed on March 30, no trace whatever being found of the semilunar cartilages, and the synovial structures being found in a "gelatiniform" condition, though the bones, in spite of the long duration of the disease, were but slightly affected. Three vessels were secured with ligatures, the wound closed with lead wire sutures and dressed with oiled lint, and the limb placed on the customary splint. By the system of rotation which prevails in the Episcopal Hospital, the patient passed out of my hands shortly after the operation, and I did not see her again, except casually, until I resumed the care of the wards in January, 1875. At that time the excision wound had cicatrized, and the resected bones were firmly united, but a number of sinuses surrounded the limb, the soft parts were much thickened and infiltrated, and the scar presented a remarkable, prominent, keloid-like appearance.

On January 4, I removed the bracketed splint, upon which the limb had hitherto been kept, and substituted a moulded pasteboard gutter, covering the site of the exseeted joint with compound iodine ointment, and a soap plaster and firm bandage. Under this treatment the swelling rapidly subsided, and the keloid-like appearance of the cicatrix disappeared, and by the middle of the month the patient walked readily with crutches. In April both splint and crutches were dispensed with, and since then Rose walks, and even runs, without any artificial assistance. She is still kept in Hospital, as a few sinuses persist, and, now nearly ten years old, is the

"Grandmother" of the ward. It is one of the sights of the Hospital to see her busily nursing and rocking a fretful nine months' baby upon whom I have lately operated for nævus.

[This patient was then presented.]

The next case, which is that of a boy who has spent one-half of his short life in our Children's Hospital, furnishes a good illustration of the too frequent futility of expectant treatment, and of the advantages of excision, in cases of gelatinous arthritis.

Case VII. *Gelatinous Arthritis in a Child; Tenotomy of Hamstring Tendons and Application of a Splint; Persistence of Disease; Excision; Recovery with Useful Limb.*—W. S., a child three years of age, was admitted to the Children's Hospital in January, 1873, shortly before the close of my term of service, which extends from August 1 to February 1. At the time of his admission he was suffering chiefly from a severe eczema, which involved almost all parts of his body, but was also affected with gelatinous arthritis of the right knee, which was much contracted, painful, and swollen. When the patient next came under my care, in the winter of 1873–1874, considering him still too young for the operation of knee-excision (which in my experience is seldom satisfactory in cases of children less than five years of age), I subcutaneously divided the hamstring tendons, and straightening the limb fixed it firmly in a moulded pasteboard splint. Temporary benefit resulted from this operation, but after a time, the patient again passing into other hands, an aggravation of his skin-disease seems to have led to the abandonment of local treatment of the joint, and when for the third time I took charge of the case, in the autumn of 1874, the limb was as much contracted as at first, and the disease was evidently making constant if slow progress.

In consultation with my colleague Dr. Hodge, we now determined upon excision, and I accordingly performed the operation in the usual way, on Dec. 10, 1874. Five ligatures were

required, the edges of the wound were brought together with iron wire sutures, and the limb placed on the bracketed splint. The semilunar cartilages were found to have almost disappeared, and the synovial structures of the joint were throughout in a state of "gelatiniform" or "pulpy" degeneration, though the articulating surfaces themselves were but slightly affected. The specimens in their recent state were brought before the Pathological Society, as reported in Vol. V. of the Transactions of that body ; page 14.

This patient was, without exception, the most restless and difficult to manage of any upon whom I have performed excision of the knee, and as a result, though the wound healed quickly, and firm bony union occurred, more angular deformity is present than in any of my other cases. The limb is perfectly strong and useful, and has been so since six months after the operation ; but it is not so straight as could be wished. The patient has been retained in hospital until the present time on account of his eczema, which persisted long after his recovery from the excision, but he is at last well, and will soon be placed in one of our city's numerous Children's Homes.

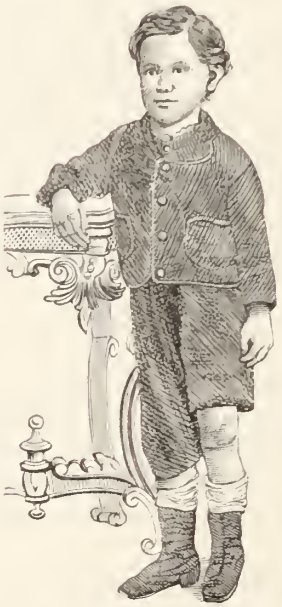
[This patient was then presented.]

In my next case, which was also one of gelatinous arthritis, the operation was followed by profuse secondary hemorrhage on the thirteenth day ; notwithstanding which the patient made an excellent and even rapid recovery.

Case VIII. *Excision of Knee Joint for Gelatinous Arthritis ; Secondary Hemorrhage ; Recovery with Useful Limb.*—James M——, six years of age, entered the Episcopal Hospital on May 7, 1875, suffering from gelatinous arthritis of the left knee, following an injury which had been received one year before. The joint was much swollen, and the limb was useless, but there was not much pain, and, as customary in this variety of arthritis, not much impairment of motion.

Excision was performed in the ordinary way on May 13, six or seven ligatures being required, and the limb being subsequently dressed as in my other cases. On the eighth day, all the ligatures and sutures were away, the wound was mostly united, the limb was in excellent position, and everything promised an uninterrupted recovery. On the thirteenth day (May 26), without any obvious cause, profuse secondary hemorrhage occurred, the wound being stuffed with clot, and the dressings saturated with blood. Knowing that no large vessel had been divided in the operation, and unwilling to

FIG. 12.



interfere unnecessarily with the progress of repair, I did not open the wound, but contented myself with applying an ice-bag and elevating the limb. The bleeding did not recur, the clots which had formed gradually became disintegrated, and were spontaneously discharged, and the wound healed by granulation. In July the patient could walk with the sup-

port of a simple pasteboard splint, and in August even this was dispensed with, bony union of the resected bones being by this time completed. The patient was retained in hospital until October, 1875, a photograph, from which the annexed illustration (Fig. 12) is taken, having been obtained before his discharge. He has been seen recently in the neighborhood of the hospital, taking an active part in a stone fight with other boys.

In the next case, as in Case VII., I at first postponed radical treatment, on account of the tender age of the patient, preferring to divide the hamstring tendons and fix the limb on a splint, a palliative operation which often serves to "patch up" the case, as it were, for a year or two, and thus enables the surgeon to select a favorable moment for more active interference.

Case IX. *Gelatinous Arthritis in a Child; Tenotomy of Hamstring Tendons; Subsequent Excision; Recovery.*—Harry V——, three years and a half old, suffering from gelatinous arthritis of the left knee, of uncertain duration, became an inmate of the Children's Hospital on June 4, 1874. When he came under my care, in the following autumn, I deemed him too young to be submitted with advantage to the operation of excision, and, therefore, having first subcutaneously divided the hamstring tendons, I straightened his limb and secured it in a moulded pasteboard splint. This was afterwards replaced by a more convenient and more elegant apparatus made for the purpose by Mr. Gemrig, and on November 26, the patient left the Hospital wearing the instrument.

On January 1, 1875, he was readmitted under the care of my colleague, Dr. Harlan, for some affection of the eye, and during the following summer was sent with other convalescent patients to the "Children's Sea-Shore House," at Atlantic City, N. J., where he was cared for by our fellow-member, Dr. W. H. Bennett. Returning to the hospital in the autumn, he again came into my charge, when I found that while his

general condition had very much improved, the disease of his knee had, in spite of the support afforded by the apparatus (which he still wore), gradually advanced, the joint being at this time much swollen, somewhat tender, and the seat of consecutive dislocation. I now determined to resort to excision, and the operation was accordingly performed on September 30, 1875, four ligatures being required, and the limb being subsequently dressed in the customary manner. The articulating bony surfaces were found slightly eroded, the semilunar cartilages having almost entirely disappeared, and the synovial membrane having undergone the characteristic "gelatiniform" change met with in this form of disease. The progress of the case since the operation has been entirely satisfactory; on November 2, the bracketed splint was replaced by a pasteboard gutter, and the patient allowed to sit up in a chair, and within the last fortnight he has been permitted to walk about the ward. He is still kept under observation, because, though the wound is healed and the limb in excellent position, the union between the resected bones is not yet sufficiently firm to allow him to dispense with artificial support to the part.

In the following case the cure is not yet far enough advanced for the patient to be reported as recovered, though his condition is entirely satisfactory, and I entertain no doubt that the ultimate termination of the case will be all that can be desired.

Case X. *Partial Anchylosis of Left Knee-Joint, with Deformity and Recurrent Arthritis; Excision.*—Stephen C——, seven years of age, entered the Children's Hospital in the early part of November, 1875, suffering from disease of the left knee-joint, of uncertain origin, but of two years' standing. The appearance of the joint and the clinical history of the patient were much the same as in Case V. Shortly after admission he underwent a slight attack of Rötheln, or German measles, which caused a postponement of operative treatment until

November 20, when excision was performed in the usual way, three ligatures being required, and the splint, etc., adjusted as in the other cases. The cavity of the joint was filled with intra-articular adhesions, a portion of the synovial membrane being in a state of gelatiniform degeneration, and a patch of caries existing in the patellar notch between the condyles of the femur.

The operation was followed by rather more than the ordinary degree of traumatic fever, accompanied by a tendency to spasmodic twitching, but with this exception the after progress of the case has presented no feature calling for special comment. A small abscess which formed in the popliteal space opened spontaneously in December, and another on the anterior surface of the leg was opened by incision in January, 1876. The excision wound is nearly healed, and union is slowly taking place between the resected bones; but too short a time has elapsed since the operation to allow any announcement of its ultimate result.

In contrast and for purposes of comparison with the preceding cases, I shall now briefly narrate the histories of five cases in which I have felt compelled to refuse the conservative operation of excision, and to sacrifice the patient's limb in the attempt to save his life. It will of course be understood that amputations for injury are excluded from this list, as are amputations for disease other than arthritis or its consequences.

Case XI. *Arthritis of Left Knee with Necrosis of Tibia; Amputation; Secondary Hemorrhage; Recovery.*—Gottlieb H——, thirteen years of age, was admitted to the Episcopal Hospital on February 16, 1865, suffering from disease of the left knee-joint with necrosis of the corresponding tibia, the result of an injury received about one year before. The joint disease was so far advanced as urgently to require operative treatment, while the extent to which the tibia was involved forbade an attempt at excision. Amputation in the

lower third of the thigh was accordingly resorted to on February 17, the limb being removed by anterior and posterior flaps, the former cut from without inwards and the latter formed by transfixion. On the seventh day after the operation, while the stump was being dressed, the ligature from the femoral artery became detached, allowing profuse hemorrhage which required the reopening of the wound and the application of a fresh ligature. But for this accident the patient's convalescence was uninterrupted; he was permitted to sit up on the nineteenth day, and was discharged, cured, on April 26, less than ten weeks from the time of his admission. The specimens derived from this case are in the Mütter Museum of the College.

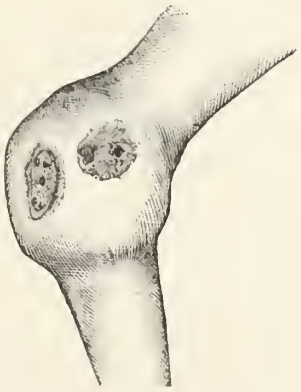
In the next case it was the constitutional condition of the patient, rather than the extent of local disease, which determined the question in favor of amputation.

Case XII. *Arthritis and Caries of the Knee; Visceral Disease; Amputation of the Thigh; Recovery.*—James C——, four years of age, was admitted to the Children's Hospital during the winter of 1869–70, and came under my care when I took charge of the wards in the autumn of the latter year. The right knee was at that time enormously swollen, and presented two large openings communicating with carious bone. The joint was extremely tender and painful, and distinct grating was developed upon moving the part. The appearance of the limb is well shown by the annexed illustration (Fig. 13), from a drawing by Dr. C. B. Nancrede. Enlargement of the liver, and the presence of albumen in the urine, with the history of prolonged suppuration—the disease was of eighteen months' standing—rendered it probable that the viscera were affected with the so-called "amyloid" or "albuminoid" degeneration; and this circumstance, together with the anæmic and irritable condition of the patient, led my colleague Dr. Hodge and myself to consider the case as ill

adapted to exeision, and to reeommend amputation in preference.

Aeeordingly, the eonsent of the ehild's parents having been obtained, the limb was removed at the junetion of the middle and lower thirds of the thigh, on September 20, 1870, a long anterior flap being first shaped from without inwards, and a shorter one cut posteriorly by transfixion. Seven or eight ligatures only were required, and the stump was elosed

Fig. 13.



with numerous points of the wire suture and dressed with lint saturated with pure laudanum. Convalescenee followed without interruption; the wound healed by adhesion; the last ligature dropped on the fourteenth day; and by the twentieth day the patient was entirely well as regarded the operation, though he was retained in hospital some time longer for the improvement of his general health.

The next case is the only one in which I have, as yet, had to deplore a fatal result after operation for disease of the knee-joint. The case was one of a very unfavorable character, but after duly weighing all its circumstances, and candidly placing the risks of treatment before the patient, amputation was recommended and accepted as offering the only prospect of recovery.

Case XIII. *Acute Destructive Inflammation of the Knee-Joint in an Elderly Man; Amputation; Death on Eighth Day.* —James W——, an Irish laborer, fifty-one years of age, and of intemperate habits, was admitted to the Episcopal Hospital on February 27, 1873. Nine weeks before, he had received an injury of the left leg, which was followed by suppuration, the knee not having become implicated until five weeks before admission. Upon examination the joint was found to be much swollen and the seat of marked fluctuation, very painful, and sensitive to touch. There was undue mobility and distinct grating within the articulation, which was evidently full of pus, with disorganization of the ligaments, and erosion of the articular cartilages. The patient's general state was, if not good, at least not very bad, and not likely to be improved by any delay in attempting to relieve his local ailments. He had a good appetite and a clean tongue, but his pulse was 108 and compressible, and he looked older than his years.

While thus operative interference seemed to be urgently demanded, the patient's constitutional condition, time of life, and previous habits, forbade excision, which in such circumstances would almost unquestionably have terminated fatally; besides, it is shown, by the experience of Mr. Holmes and of other surgeons who have most judicially considered the subject, that, in these cases of rapid disorganization of a joint, in examples (if I may be allowed the expression) of the *acute* form of chronic disease, excision offers a less favorable prospect than amputation.

The latter operation was accordingly recommended, and, having been acceded to by the patient, with a full understanding of its risks, was performed on March 4, 1873, a long anterior flap being taken from the front of the knee, and a short posterior flap cut by transfixion. A large number of ligatures (fifteen or sixteen) were required, and some difficulty was met with in securing the popliteal artery, which was so atheromatous as to be cut through by two ligatures before it was at last safely tied. The patient reacted well after the

operation, and for a few days a successful issue was hoped for. Then his belly became tympanitic, he was slightly delirious, and manifested a tendency to colliquative sweating. The sutures were removed on March 10, when the flaps were found to have become adherent; an abscess which had formed on the outer side of the thigh was opened on the following day; and on March 12, eight days after the operation, the patient died quietly, without any marked change having occurred in his condition, and apparently from simple exhaustion.

Dissection of the amputated limb showed, as had been expected, that the joint was full of pus; the crucial ligaments had almost disappeared; the lateral ligaments and semilunar cartilages were in an early stage of gelatiniform change, and the femoral condyles were roughened.

In the next case, as in that of Gottlieb H., the extent of bone disease was too great to admit of a cure by excision.

Case XIV. *Gelatinous Arthritis of Left Knee with Intra-Articular Abscess and Caries of Tibia; Amputation; Recovery.* —Frederick G., thirteen years of age, a pupil of the Soldiers' Orphans' Home of Trenton, N. J., was admitted to the Children's Hospital on December 29, 1873, suffering from disease of the left knee-joint of five years' standing. The knee was very painful and evidently full of pus, while the upper portion of the tibia was far advanced in caries, the patient too being markedly anæmic. Amputation was performed in the usual way on January 2, 1874, the femur, tibia, and patella, all being found carious, and the cartilages in a state of gelatiniform degeneration. The patient rapidly convalesced after the operation, sitting up on the ninth day (the last ligatures having dropped on the seventh), and walking with crutches on the twenty-sixth. By the forty-fifth day the stump was entirely healed, and the patient was discharged, cured, on March 21, less than twelve weeks from the time of his admission.

The next case, which is also the last which I shall bring before the College upon this occasion, was perhaps the least promising with which I have had to deal; it furnishes a striking illustration of the benefits conferred by the "humane operation" in cases otherwise quite irremediable.

Case XV. *Arthritis of both Knees with Necrosis of both Tibias; Amputation of Left Thigh; Tenotomy of Right Hamstrings and Extraction of Sequestra from Right Tibia; Recovery.*—Daniel McA., eighteen years of age, was admitted to the Episcopal Hospital on March 6, 1874. He had been recently discharged from another hospital as incurable, and indeed seemed as unfavorable a subject for operative treatment as could be imagined. In the first place he was a confirmed epileptic, and then his bone and joint disease, which was of between two and three years' duration, had reduced him to such a condition of anæmia and emaciation that he seemed, so to speak, almost at death's door. The left knee-joint was completely disorganized, the corresponding tibia far gone in central necrosis, and the lower part of the femur carious. On the right side, the disease was not so far advanced; the joint affection was comparatively slight, and a loose sequestrum showed that nature had made some effort towards repairing the mischief done in the tibia. The only favorable circumstances of the case were the youth of the patient and the want of any positive evidence of visceral complication.

Having allowed the patient a few days to recover from the fatigue of his journey to the hospital, I determined, in consultation with my colleagues, to give him what seemed his only chance for life, and accordingly proceeded, on March 16, to amputate the left thigh, just above the knee, guarding against hemorrhage by the use of Esmarch's elastic cord and bandage, of which we were then just beginning to read in the foreign journals. And here let me say that, without the assistance afforded by this admirable invention, I doubt if the operation could have been successfully completed. The

limb having been removed by antero-posterior flaps, the carious femur was freely gouged, seven or eight vessels secured with ligatures, and one which was near the bone controlled by acupressure, the stump being then closed with wire sutures, and dressed with laudanum in the ordinary way. Turning my attention next to the right leg, which in turn was rendered bloodless by Esmarch's method, I removed the sequestrum, which, as already mentioned, was quite loose, and, after subcutaneously dividing the hamstring tendons, straightened the limb, and fixed it securely in a padded pasteboard splint.

From the time of the operation the patient steadily convalesced. The last ligature dropped on the tenth day, the amputation wound united by adhesion, and on October 19, the patient was discharged in very much improved health, though of course still epileptic, and with a few sinuses still discharging. He was readmitted in the following spring, when I removed a sequestrum from the stump which soon after permanently healed. The right leg had then long been cicatrized, and the corresponding knee, though somewhat stiff from want of use, presented no sign of inflammation. I last saw this patient in September, 1875, when he walked readily with crutches, had gained considerably in flesh, and, barring his epilepsy, was in a very fair state of health.

I have thus completed my tale of cases, and the time already occupied warns me to be brief in what I have yet to say. The remarks which I have to offer may be put in the form of answers to the following questions, viz. :—

I. When should the surgeon abandon expectant measures in the treatment of knee-joint disease, and what may be considered the indications for a resort to operation?

II. Operative interference having been resolved upon, how shall the surgeon decide between excision and amputation?

III. When an attempt is made to save the limb by excision, how shall the operation be performed, and what shall be the after-treatment?

I. In order to give an intelligent answer to the first question, it is necessary to consider what are the prospects of recovery without operation, and what the condition of the limb is likely to be if such a recovery can be obtained. To no class of diseases is the maxim "obsta principiis" more applicable than to joint affections, for if carefully treated from their beginning they seldom terminate badly. Of course I am not speaking now of *wounds* of joints, for they are always very serious injuries, and too often end, even under the most favorable circumstances, in the loss of life or limb. But, in their early stages, inflammatory affections of even the largest joints, whether following upon contusions or sprains, or of non-traumatic origin, are usually quite amenable to treatment. No doubt in some few cases there is such a constitutional predisposition to destructive bone-and-joint disease, that from a very slight cause very serious consequences may ensue: thus some years ago a boy was under my care, who from a fall on the ice received a contusion of the elbow, followed in a few days by suppuration of that joint, and then by acute necrosis of the humerus and pyarthrosis of the shoulder, and whose life was barely saved by amputation at the shoulder-joint; but such cases are happily exceptional, and in a large majority of instances, if the patient can be at once put under careful and judicious treatment, a favorable result will follow.

But, unfortunately, these cases at first seem so trivial

that they are too commonly neglected until the disease is far advanced. A distinguished American surgeon, referring to his own case, spoke upon one occasion of the time when he had had the misfortune *not* to break his leg; had he sustained a fracture, he would have taken care of himself and would have been well in a few weeks, but by neglecting a sprain he entailed upon himself a much longer period of disability. And so it happens that in many—perhaps half—of the cases of joint disease which are brought to our hospitals, the time has already past during which treatment, to be most efficient, should have been employed. Thus of the ten cases of knee-excision which I have reported to-night, in only one had the disease lasted less than one year, the duration in the other cases ranging from one to six years. I do not deny that in some of these cases recovery might perhaps have been eventually obtained without operation, but what kind of recovery would it have been? We do, indeed, meet men and women hobbling about on crutches, with knees bent, and limbs withered and deformed, and such results may doubtless in a certain sense be called spontaneous cures; but what is here claimed is that the limbs preserved by expectant treatment in these advanced cases of joint disease, are inferior to the limbs secured by the conservative operation of excision, and little if any better than no limbs at all.

I have dwelt upon this point at some length, because I believe that there are still many members of our profession who look upon excision of the knee-joint as a remedy of doubtful excellence, and who think that cases not bad enough for amputation should not be operated on at all.

In deciding whether an operation is required in any particular case of knee-joint disease, the surgeon must consider the age and general condition of the patient, the duration of the affection, and the stage to which it has advanced.

As regards *age*, no operation should as a rule be performed in cases occurring in very young children. No doubt in some rare instances the life of the patient may be in danger from the exhaustion produced by an inflamed and suppurating knee-joint, and in such cases the surgeon must choose the least of two evils and remove the source of irritation by amputating the limb. But in the large majority of cases it is better to temporize, to put the part in as good a position as possible by straightening the limb, dividing tendons if necessary, and, as it were, patching up the joint until the patient reaches an age when operative interference can be adopted with a better prospect of success. Excision of the knee is not a very successful operation in quite young children; these suffer more from confinement than those who are older, the restraint necessary during the after-treatment is more irksome to them, and they are, I think, more liable to the insidious development of tuberculous and other constitutional diseases. My own rule has been to postpone operation until the child has attained to at least the age of five years, and those cases which I have seen operated on by others at an earlier period of life, have usually done badly. Again, in persons past the middle age, unless amputation is positively required to rescue the patient from impending death, it is better as a rule to avoid operation. The mortality after excision is so great in these cases that

prudent surgery would, it seems to me, under such circumstances, dictate rather to take the chances of a cure by the efforts of nature, than to attempt to hasten recovery by operation.

The most favorable age for excision of the knee as regards life is from five to ten, but there is more risk then of consecutive shortening than at a later age, and the occurrence of bony union is perhaps obtained with more difficulty; hence the period of puberty is probably upon the whole that which may be considered to furnish the most favorable results.

In considering the *general condition* of the patient, when the question of operation arises, the surgeon must remember that these are essentially chronic cases, and that there can seldom be any justification for haste in operating, when by delaying a few weeks, or even months, the patient may be placed by constitutional and hygienic treatment in a more favorable condition to sustain whatever operation may be necessary. The presence of visceral disease, whether of the lungs or abdominal organs, must usually be considered a positive contraindication to excision, and under these circumstances, unless the local condition of the knee render amputation imperative, no operation should, as a rule, be performed. On the other hand, if the patient presents no evidence of visceral disease, and the general health seems to be directly suffering from the irritation arising from the diseased joint, the timely removal of the source of disturbance either by excision or amputation may prove the starting point of rapid convalescence.

The *duration of the malady* must be considered by the surgeon in any case of knee-joint disease before

deciding upon the propriety of an operation. I am not one of those who hold that a surgeon is bound invariably to wait a certain number of weeks or months to give, as is often said, a "fair trial" to other treatment before recommending an operation, for I believe that a thorough knowledge of the course and natural history of the disease will often enable him to say at once whether any particular case can or cannot be benefited by expectant measures. In their early stages, as I have before remarked, these knee-joint affections are quite amenable to treatment, and hence, putting out of the question some few cases of very rapid articular disorganization in which amputation is required (such as Case XIII.), a judicious surgeon would in cases of recent origin endeavor to obtain, and would probably succeed in obtaining, a natural cure by placing the joint in good position, and at rest, by relieving intra-articular pressure by the use of continuous extension, and by combating the morbid process by careful constitutional and local treatment.

And here let me digress for a moment to reiterate my profession of faith, so much objected to by my distinguished friend Prof. Sayre, of New York, that these chronic joint affections, though unquestionably local diseases, are not of exclusively local origin, and that they require constitutional as well as local treatment. Would, I repeat, that another Abernethy might arise among us, and direct our attention once more to the Constitutional Origin and Treatment of Local Diseases!

In a recent case then, an operation can seldom be required; on the other hand, if the disease has lasted many years, the process of natural cure (such as it is)

being pretty well advanced, and the patient perhaps past the age at which excision would be likely to prove successful, the prudent surgeon would usually decline an operation, and content himself with straightening the limb either by gradual or immediate extension, then placing it at rest in a suitable splint, and simply aiding nature to complete the cure by anchylosis. But in the intermediate cases (and, as already remarked, these constitute a large proportion of those which come under the care of the hospital surgeon), when the disease has already lasted many months or even several years, and when from careful examination of the joint the surgeon is satisfied that its functions are permanently abolished, an operation may often be properly recommended as a means both of preventing suffering and of restoring the patient to active life more promptly than can be done by any other mode of treatment.

Even more worthy of consideration than the duration of the disease, is the *stage to which it has advanced;* and it is here to be remembered that the course of these joint affections varies much in different cases. No operation is, as a rule, justifiable as long as the disease is limited to the synovial membrane, no matter how long the patient may have been affected: no man in his senses would recommend either excision or amputation in a case of mere hydrarthrosis. Nor even in a case in which all the tissues of the joint are evidently implicated should an operation be hastily recommended, as long as the integrity of the parts is maintained, and a hope remains that by subduing the inflammation the usefulness of the articulation may be preserved. But when the relaxed condition of the joint, and the occurrence of consecutive dislocation,

show that the crucial ligaments and semilunar cartilages have disappeared; when the limb is contracted and helpless, and the patient gives a history of repeated relapses from comparatively slight injuries; or, on the other hand, when the doughy semi-elastic character of the swelling shows the existence of gelatinous arthritis (the typical "white swelling" of the older writers), an operation may be properly resorted to even though the limb be at the time in a quiet condition. When in addition the joint is in a state of suppuration, and still more if there be caries of the articular surfaces, an operation may be considered (other things being favorable) as almost imperative.

In saying this I am not ignoring the fact that Mr. Haward and other British surgeons have applied mineral acids to the interior of diseased knee-joints, and have recommended this mode of treatment as a substitute for excision. But the results of the new method have not been uniformly favorable, and excision has been found so satisfactory in my own hands that I have not felt tempted to abandon a tried and proved operation for a procedure which at least has not as yet been shown to be an improvement.

It may be observed that in cases of *gelatinous* arthritis, an operation may be properly recommended at a comparatively early period; the reason for this is that in the gelatinous form of the disease there is commonly no tendency to a spontaneous recovery, and though in private practice, among the more wealthy classes, such a case may occasionally be brought to a favorable termination, in the class of patients met with in hospitals, a recovery without operation may practically be considered as out of the question.

II. The answer to my second question has of necessity been to a great degree anticipated in considering the first. The choice between excision and amputation must largely depend on the surgeon's belief as to the relative gravity of the two operations, and upon this point I have no hesitation in saying that I regard excision as a much more serious operation than the other. This is not a question to be decided by statistics (though I believe that if the comparison could be fairly made the result would be found in favor of amputation), for excision is habitually performed in selected cases, while all the rest are reserved for amputation.

It is true that among my own cases I have had no fatal result to deplore after excision, though I have had one after amputation; but had all been amputated the result would have probably been equally good; had all been excised the mortality would undoubtedly have been much larger.

And this is indeed the true point of view from which to look upon the question. The surgeon's first thought should undoubtedly be of excision—for when successful the result is immeasurably superior to the best result of amputation—but before deciding upon this operation he should weigh well all the circumstances of the case, the age and constitutional condition of the patient, the extent to which the bones entering into the articulation are affected, and the facilities which will be afforded by the patient's surroundings for conducting the after-treatment (often prolonged and wearisome) to a successful issue. If then the patient be neither too young nor too old, if there be no evidence of visceral complication, if the disease be

sufficiently limited to allow of its entire removal without taking away so much bone as would materially impair the usefulness of the limb, and if the patient be so situated that the question of the time required for recovery is of secondary importance, the surgeon should choose excision, and by doing so will probably succeed in preserving for his patient a limb better than any artificial substitute, and in most cases better than could be obtained by the unaided powers of nature; under opposite circumstances, provided that the case is bad enough to require any operation, amputation should be resorted to, and the surgeon who employs it under such, and only under such, circumstances, will not have occasion to regret his decision.

III. A few words must suffice as to the mode of performing knee-joint excision. Of the various incisions which have been suggested for exposing the articulation, three only have acquired general favor, viz.: the H incision, the *horseshoe* or U incision, and the simple *transverse* incision across the front of the joint.

The H incision was first employed by Moreau, has been adopted by Butcher, and is still preferred by some surgeons, including Prof. Hamilton, of New York. Provided that care be taken to make the lateral incisions far back, so as to allow of free drainage, this method answers a good purpose, and is certainly easier for the beginner than either of the other forms of operation; it, however, makes an unnecessarily large wound, and is in my judgment far inferior to the operation by transverse incision.

The U, *horseshoe*, or *semi-lunar* incision was intro-

duced by Mackenzie, and is now advocated by such high authorities as Prof. Humphry, of Cambridge, Prof. Erichsen, of London, and Prof. Gross, of this city. This method makes a smaller wound than the H incision, but does not afford such free access to the joint.

By far the best procedure, in my judgment, is that originally suggested by Park, in the postscript to his famous letter to Mr. Percival Pott, but which seems to have been first employed by Textor, Kempe of Exeter, and Sir William Fergusson. It consists in making a single transverse incision across the front of the joint, immediately below the patella, the extremities of the wound being carried well backwards so as to ensure free drainage during the after-treatment. When the limb is much contracted, as it often is in these cases, this incision, though made transverse to the axis of the tibia, forms, when the limb is extended, a somewhat obliquely curved wound with its convexity downwards, and thus really constitutes a flap operation. By dividing the ligamentum patellæ, the joint is opened, and the surgeon then proceeds to divide the lateral ligaments, and the crucial ligaments if any portion of these is remaining.

The next step is to clear the condyles of the femur for the application of the saw, and it is here ordinarily recommended to dissect back all the overlying tissues, including the patella, which is subsequently to be removed from within; but this, in cases in which the parts are much thickened and infiltrated, is a very troublesome business, and when it is accomplished the result is not very satisfactory, for the cavity left by removing the patella almost invariably suppurates,

and as a consequence abscesses form and leave persistent sinuses above the wound. Moreover, all that is really needed as a covering to the bone is the skin and subcutaneous fascia, and hence in my more recent cases I have simply dissected these back to the level at which it is meant to apply the saw, and have then cut directly down to the bone, thus removing together the extremity of the femur and the patella, with the diseased tissues by which the latter is surrounded.

For clearing the posterior surface of the condyles, I employ a very strong probe-pointed knife with limited cutting edge, as recommended by Mr. Erichsen, having, I confess, a strong objection to the use of sharp-pointed instruments in the neighborhood of the popliteal vessels.

For making the bone sections, I invariably employ a "Butcher's saw," reversing the blade so as to divide the bone from below upwards. I may give a practical hint as to the use of this instrument, which is that, in sawing in the manner indicated, the blade of the saw should be so fixed that its teeth will point *backwards;* in sawing *downwards*, the force of the arm is applied in *pushing*, but in sawing *upwards*, in *pulling*, and the blade of the instrument should be arranged accordingly.

In removing the articular extremity of the femur, it must be remembered that the internal condyle is situated lower than the external, and that hence the line of section must be parallel to that of the free surface of the condyles, and therefore oblique to the axis of the femoral shaft, as otherwise the natural inclination of the limb would not be preserved. As, too, the epiphyseal line is higher in front than behind, a safe

rule is that the condyles should be sawn in a plane *which as regards the axis of the femur is oblique from behind forwards, from below upwards, and from within outwards.* The tibia should be sawn in a plane transverse to the long axis of the bone, with a slight antero-posterior obliquity to correspond with that of the section of the femoral condyles. In order to avoid interfering with the epiphyseal junction, and thus hindering the future growth of the limb, care must be taken not to remove the whole of the condyles; it is quite sufficient to take away the anterior portion—that which articulates with the tibia in the position of extension—a slice varying from half an inch to an inch in thickness according to the size of the bone. From the tibia a still smaller portion may be removed, all that is needed here being to obtain a smooth section to be opposed to that of the femur. It is a good plan to snip off the sharp posterior edges of both bones with cutting pliers, so as to avoid all risk of injury to the tissues of the popliteal space.

The bone sections having been made, the surgeon should examine the condition of the sawn surfaces, and deal with any softened or carious patches by the free use of the gouge and osteotrite. The same plan may be pursued with any portion of diseased bone or cartilage beyond the line of section.

The next step of the operation is to clip away with scissors curved on the flat, or with Mr. Butcher's "knife-bladed forceps," any shreds of disorganized synovial membrane or ligament, taking care, however, not to disturb the floor of the wound, which should if possible be left intact.

The surgeon may next proceed to adjust the resected

bones, when if they cannot be brought into position by any justifiable amount of force, he should divide the hamstring tendons, and if this does not suffice must remove an additional slice of bone.

All bleeding vessels having been carefully secured by ligature, the wound may be brought together by stitches, and the limb adjusted upon the splint which is to be employed during the after-treatment. This adjustment is, I think, best effected while the limb is elevated to nearly a vertical position, there being under these circumstances no difficulty in keeping the bones together, while, if brought down to a horizontal line, there is a constant tendency to displacement from the weight of the leg. The application of the splint should be completed before the patient is allowed to recover from the state of anæsthesia which should be fully maintained during the whole operation.

Two points still require notice in regard to the operation itself: first, as to the control of bleeding during the operation, and, second, as to the mode of dealing with the patella.

I employ no tourniquet nor other means of interrupting the circulation during the operation; no large vessel is divided, and I believe it much safer to tie each small artery as it is cut, than to run the risk (which is by no means only theoretical) of having consecutive hemorrhage from vessels which under temporary compression have retracted, and which do not bleed until the patient becomes warm in bed.

Even if the patella is not itself diseased, it should, I think, be removed; as the after-treatment aims at obtaining bony union, the patella is of no use, and statistics show that the risks of the operation are greatly increased by its retention.

The points specially to be considered with regard to the after-treatment, are the choice of a splint, the position in which the limb is to be kept, and the frequency with which it should be dressed.

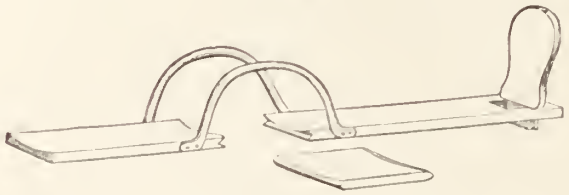
The most elegant and altogether the best splint for the after-treatment of knee-joint excisions, is, I doubt not, that known as Price's, which consists of a posterior metal splint, cut away beneath the knee, with an arrangement by which it can be lengthened or shortened, a bracketed wooden external splint to guard against outward bowing (to which there is always a strong tendency in these cases), and a movable wooden foot-piece. The objections to Price's apparatus are its expense, and its complicated nature. Butcher's "box splint" has answered a very good purpose in the hands of its introducer, but seems to me unnecessarily cumbersome, and the same may be said of the tin splint which is, I believe, generally used in Boston. Dr. Watson, of Edinburgh, employs a posterior moulded splint, with an anterior bracketed rod by which the limb can be suspended.

The splint which I have employed in all the cases upon which I have hitherto operated, is based upon that originally introduced into the Episcopal Hospital by my colleague, Dr. Packard,[1] but with certain modifications which I think improvements (Fig. 14). Dr. Packard's is a bracketed splint, the brackets being attached on either side to a posterior wooden splint which is interrupted below the knee, instead of to a side splint as in Price's apparatus, or anteriorly as in that of Dr. Watson. The deficiency in the posterior splint is filled by

[1] Trans. Coll. Phys. Philadelphia, 2d S., vol. iv., p. 342.

a trap, which, on the suggestion of our fellow-member Dr. Edward Hartshorne, I have latterly had made to be lifted in and out and to be held in place by turn-buttons, instead of sliding, as in Dr. Packard's model.

Fig. 14.[1]



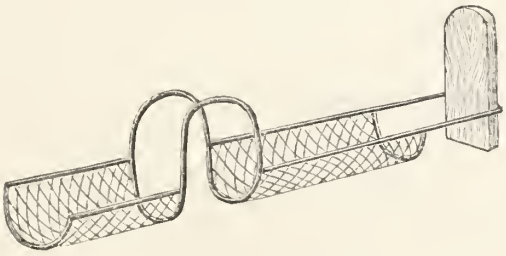
I have also added a movable foot-board, as in Price's splint, which I consider a very important improvement, and one which I observe that Dr. Packard has adopted in his latest published description of his apparatus. I have moreover dispensed with the laced-up leather side pieces which Dr. Packard employs, finding that the limb can be much more securely as well as simply fixed upon the splint with broad strips of adhesive plaster and roller bandages, than with these more complicated appliances. To guard against outward bowing of the limb I have sometimes inserted a short wooden side-splint between the external bracket and the limb, but have latterly found it sufficient, with children at least, to pass a loop of adhesive plaster around the outer side of the limb, and fasten the ends of the strip to the internal bracket. I have not had occasion to employ the ingenious truss-pad arrangement suggested by Mr. Swain. The splint, before it is applied, should be thoroughly padded with cotton-wool, or, which is better, with picked tow, and the

[1] This illustration represents a splint with sliding trap, as employed in my earlier cases.

limb should be secured in position before the trap is put in.

The great merits of this splint are its simplicity and cheapness; it is, however, necessarily heavy, and, the wood getting saturated with the discharges, after a time it becomes offensive. I have therefore desired Mr. Gemrig to make for me a wire splint (Fig. 15), so arranged as to surround the lower half of the limb, bracketed at both knee and ankle, and provided with a foot-piece, which I purpose using for a patient upon whom I expect to operate in a few days, and which I hope will prove both lighter and cleaner than that which I have hitherto employed.[1]

Fig. 15.



In what position shall the limb be placed after excision of the knee? Some surgeons recommend a slightly flexed position, believing that a somewhat bent limb is more useful than a straight one. This I regard as an error; a stiff *unresected* knee is no doubt better when anchylosed at a slight angle, so as to enable the patient to walk without swinging out his limb like that of a compass; but by excision the limb is neces-

[1] Since this paper was read I have employed the wire splint in two cases of knee-excision (in adults), and have found it perfectly satisfactory.

sarily so much shortened as to obviate any risk of this compass-like motion, and consequently the straighter it can be made the better it will be for the patient. I have had the opportunity of comparing the results of both methods in practice, and have no hesitation in deciding in favor of the straight position.

No rule is more important in the treatment of these cases than that the limb should be undisturbed after the operation. The wound, of course, must be dressed daily, but when the splint is once applied there should be no necessity for readjustment until the process of bony union is well advanced; six weeks is none too long for the splint to remain without renewal, and under no circumstances should it be disturbed within the first fortnight. I believe with Price and Swain that a neglect of this rule has been answerable for many of the failures of knee-joint excision. In the later stages of the after-treatment I have found it convenient to replace the bracketed splint by a single moulded pasteboard gutter made to embrace the posterior half of the limb.

Should, unfortunately, caries or necrosis recur after excision, and render further interference necessary, a re-excision may be properly attempted, or, if this be thought impracticable, life may still be saved by amputation.

A very brief reference to the *statistics* of the operation must conclude this paper. The most elaborate statistics of knee-joint excision which have hitherto been published are those of Pénières, who has tabulated 431 cases of excision for *chronic disease*, the mortality of the whole number being over 30 per cent. The

death-rate varies according to the age of the patient, being nearly 39 per cent. during the first five years of life, only 15.5 per cent. during the next quinquennium, then 19 per cent. up to the age of fifteen, 33 per cent. from that to twenty-five, and nearly 43 per cent. for all later periods. Of the whole number of cases, 247, or 57 per cent., recovered without further operation; six, or a little over one per cent., after re-excision; and 47, or nearly 11 per cent., after amputation. In 166 cases (38.5 per cent.), it was known that the patients had preserved useful limbs. These statistics, it must be remembered, include all the early cases, and many which at the present day would not be thought suitable for excision. By care in regard to the selection of cases, and by attention to the after-treatment, much better results can now be obtained.

The statistics of excision of the knee for *gunshot injury* have been particularly investigated by Cousin, Chenu, Lotzbeck, and Küster. Cousin finds that 33 cases of total excision have given 28 deaths, or 85 per cent., while 11 cases of partial excision have given 10 deaths, or 91 per cent. Of the whole 44 cases, 38 proved fatal, a mortality of over 86 per cent. Chenu's figures, derived from the records of the Franco-Prussian war, show a still larger death-rate, 37 complete excisions having given 33 deaths, or 89 per cent., and 65 partial excisions 62 deaths, or 95 per cent., the whole 102 cases giving 95 deaths, or over 93 per cent. Lotzbeck's and Küster's statistics, though somewhat more favorable, are still sufficiently gloomy, 66 cases collected by the former writer giving 48 deaths, or nearly 73 per cent., and 101 cases collected by the latter giving 66 deaths, or over 65 per cent. When we

compare these figures with the death-rate of amputation in the lower third of the thigh for gunshot injury (55 per cent. according to Légouest, 50 per cent. according to Mc Leod), we cannot, I think, but indorse the dictum of Guthrie that "wounds of the knee-joint from musket-balls, with fracture of the bones composing it, require immediate amputation," and conclude that the operation of knee-joint excision should be banished from the practice of military surgery.

For lesions of the knee-joint from traumatic causes other than gunshot injury, excision might properly be attempted, if the patient were young and healthy, and the destruction of parts comparatively slight. The number of cases in which the operation has been performed under such circumstances is, however, too small to be of value for statistical use.

SUMMARY OF THE CASES DETAILED IN THE PRECEDING PAPER.

I. *Excision.*

No.	Sex and age.	Nature of disease requiring operation, and side affected.	Duration of disease before operation.	Result; duration of treatment after operation.	Remarks.
1	Male, 10	Partial anchylosis of right knee with recurrent arthritis	Four years	Recovered; five months	Useful limb.
2	Female, 11	Arthritis of right knee following smallpox	Six years	Recovered; one year	Do.
3	Male, 18	Arthritis of right knee with intra-articular abscess	One year	Recovered; sixteen months	Do.
4	Male, 9	Arthritis of left knee with abscess	Three months	Recovered; four and a half months	Do.
5	Female, 9	Arthritis of left knee with partial anchylosis	Two years	Recovered; twenty months	Do.
6	Female, 8	Gelatinous arthritis of right knee	Three years	Recovered; still under observation	Do.
7	Male, 5	Gelatinous arthritis of right knee	Over two years	Recovered; six months	Do.
8	Male, 6	Gelatinous arthritis of left knee	One year	Recovered; five months	Do.
9	Male, 5	Gelatinous arthritis of left knee	About two y'rs	Recovered; still under observation	Still wears splint.
10	Male, 7	Partial anchylosis of left knee with recurrent arthritis	Two years	Convalescent; still under observation	Do.

II. *Amputation.*

11	Male, 13	Arthritis of left knee with necrosis of tibia	One year	Recovered; two and a half months	
12	Male, 5	Arthritis with caries of right knee	Eighteen mos.	Recovered; three weeks	
13	Male, 51	Acute disorganization of left knee-joint	Five weeks	Died; eight days	Death from exhaustion.
14	Male, 13	Gelatinous arthritis of left knee with caries	Five years	Recovered; seven weeks	
15	Male, 18	Arthritis of left knee with necrosis of tibia	Over two years	Recovered; fifteen months	

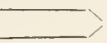
[After the reading of the preceding paper, Dr. JOHN H. PACKARD said:—]

I desire to call attention to a few points in reference to the splint devised by me, and mentioned by Dr. Ashhurst in his interesting paper just read. These points have not always been observed by those employing, or intending to employ, this splint: and yet they are in my opinion so essential to its proper construction, as well as to its effective and convenient use, that the neglect of them prevents a fair trial of the apparatus.

The first point is to get an accurate outline of the limb, by laying it on a large sheet of paper, and carrying a lead pencil around it, from the greater trochanter on the outer side, up to the perineum on the inner. If the limb cannot be straightened, the outline should be made on the paper by measurement; then, cutting out the piece so defined, it should be tested and corrected by applying it to the under surface of the limb. The shape of the fold of the buttock should be carefully traced. Finally, the exact points should be marked at which the section for the trap for the knee is to be made; the inner ones should be nearer together than the outer ones, so that the lines may converge somewhat.

By this outline the splint should next be cut, out of stuff proportioned in thickness to the size of the limb; for an adult, a board an inch thick is about right. At the heel, the splint should be made some three inches longer than the outline, and if it be made to extend out three inches on each side it will serve to keep the limb steadier. For some distance from its upper end, the splint should be carefully bevelled, so as to prevent any pressure of an edge against the skin; and the whole splint should be slightly hollowed from side to side, so as to form a very shallow trough, as it were, for the limb. At the heel this hollow should be made much deeper than elsewhere, and a longitudinal slit should be mortised to receive the tenon of the foot-piece.

The second point is as to making and arranging the trap or sliding shelf for the knee. The middle of this should come just opposite the wound of operation. In sawing it out the saw should be carried so as to make the side view of it thus:



By this simple plan its edges and the corresponding grooves are made to fit perfectly, and when in position it is firmly supported. The edges converging somewhat, as before described, the removal and re-insertion of it are very easy. After trial of many plans for securing it in position, I prefer two simple screw-eyes, with corresponding hooks, at the inner edge, to any other. The objection to any catch underneath, such as the one employed by Dr. Ashhurst, is that the whole apparatus must be raised so high in order to work it; and iron hasps are very apt to become rusted.

The brackets, just at their junction with the leg and thigh pieces, should be bent directly outwards for about half an inch; otherwise, if swelling takes place, the soft parts bulge out against them, and are painfully pressed upon.

By protecting the trap with oiled silk or muslin, placed beneath the padding, it can be kept as clean as any other part of the apparatus.

Third, as to the leather side-pieces, lacing in front of the leg and thigh, and over the knee. The great advantage of these is that they can be loosened or tightened at pleasure, without raising the splint or disturbing the limb; this, which in adults is of great importance, cannot be done with bandages or adhesive straps.

A splint made on the plan now described has been in use in the case of Margaret I., æt. 39, operated on by me at the Episcopal Hospital February 3, and has answered the purpose perfectly. Some years ago I tried a splint on the plan of that proposed by Dr. Ashhurst, but with tin in place of the wire gauze; and had to abandon it because it was deficient in firmness.

The weight of a splint, intended to keep a limb at perfect rest, can hardly be an objection to it.

[Dr. H. Lenox Hodge said:—]

In my cases of excision of the knee I have always used a splint similar to the one exhibited to-night by Dr. Ashhurst. In the treatment of excisions of the knee it is of the greatest importance that the limb should be kept perfectly still and firmly attached to the splint. These objects are well attained by means of strips of adhesive plaster applied like a bandage to the splint and limb. Any plan of lacing would be much less efficient, as it would allow more motion, and would be more apt to loosen and to con-

strict the tissues unevenly. That portion of the splint which is beneath the line of excision should be capable of being removed with the least possible jar to the limb. This object is well accomplished in the splint above alluded to, or by attaching a hinge to one side of the movable piece. A sliding portion with a tongue and groove would be very apt to become tight and difficult to move by the swelling of the wood from absorption of the discharges.

In addition to witnessing the result in children as shown by Dr. Ashhurst's patients to-night, it will, no doubt, be interesting to the College to see the result in adults, and I shall take an early opportunity to exhibit two cases in both of which, after excision of the knee, the limb has proved exceedingly useful. One man does with ease the hard work of a driver of a street-car, and the other does active duty as a night nurse in the hospital.

CASES

OF

EXCISION OF THE KNEE IN ADULTS.

By

H. LENOX HODGE, M.D.,

DEMONSTRATOR OF ANATOMY IN THE UNIVERSITY OF PENNSYLVANIA, SURGEON TO THE PRESBYTERIAN HOSPITAL AND TO THE CHILDREN'S HOSPITAL, CONSULTING SURGEON TO THE HOSPITAL FOR RELIEF OF DISEASES OF THE RECTUM AND URINARY ORGANS, CONSULTING PHYSICIAN TO THE LYING-IN DEPARTMENT OF THE NORTHERN DISPENSARY.

[Read April 5, 1876.]

THE cases which I take occasion to exhibit to the College to-night are my cases of excision of the knee in adults. At some future time I hope to present my cases of excision of the knee in children.

CASE I.—The first case is that of David Hunter, twenty-nine years of age. His present occupation is that of a car-driver on one of the city passenger railways. The operation of excision of the knee was done in April, 1873. We have thus waited three years, and are, therefore, well able to judge of the result of the operation.

His previous history presents the following facts: His parents were healthy and are both living. He knows of no tendency to disease in his family history. A brother, however, has an abscess in his neck, and a sister has enlarged cervical glands. When he was four years old, he fell from a wheel-barrow, and a stone fell upon his left knee. This was

followed by inflammation, and for a year or more he could only walk with crutches. When he was about twelve years of age, he fell and broke his left thigh. He was taken to the Pennsylvania Hospital, and there made a good recovery. When about twenty-one years old, he was accustomed to take active exercise, and one day after riding into the city from Chestnut Hill on a horse without a saddle, his left knee became swollen and painful. An abscess formed, and after a time discharged on the leg below the knee on the inner side.

After suffering much pain for several years he was admitted to the Presbyterian Hospital February 5, 1873. There was then extensive arthritis of the knee-joint. He was unable to walk without pain, and needed assistance from a cane to move at all. He gave his consent to the operation of excision, and it was done in April, 1873.

The joint was exposed by a straight incision. The condyles of the femur were found extensively diseased, the patella completely adherent to the femur so that it had to be separated by a chisel, and the head of the tibia softened and in several places penetrated by abscesses, which required the gouge. The case was indeed a bad one, and at the time of the operation one of my colleagues said, "if that man gets well, I will believe that any man can." The wound was dressed with carbolized oil and placed upon a bracketed splint. He did perfectly, had no bad symptoms, and was discharged from the hospital well on July 25, 1873, a little more than three months after the operation.

He was then able to walk easily and well, and soon went to work driving the horses of a street car, and for pleasure, when off work, taking long walks. One day he and a friend, a healthy, sound man, started to walk to League Island. My patient was ready and able to walk the whole distance; his friend gave out before they reached the Island. The limb before the operation was small and very thin. It has increased much in size and strength. His general health has also greatly improved.

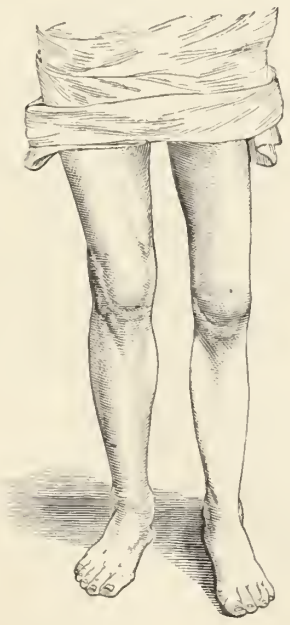
The result obtained in this case most strikingly illustrates the benefits which may sometimes be obtained from excision, as a consideration of the following points will more fully show:—

The time occupied in treatment after operation was only three months. The usual average is about eight months.

The wound was entirely closed in that time, and has never re-opened.

The bones were then firmly united together, and have remained perfectly firm ever since.

Fig. 1.



The limb is straight. There is no bending or bowing in any direction.

The shortening is three and one-half inches, and is

compensated by a thickened sole to his shoe. Part of the shortening is probably due to the fracture of the thigh which occurred when he was twelve or thirteen years old.

He walks easily and with only a slight limp. He can walk long distances and rapidly, and does not use crutch or cane. Time has tested the usefulness of the limb. It remains useful after three years, and enables him to support himself and family by active labor.

The photograph (Fig. 1) exhibits the condition of the limb one year after the operation, and the Fellows of the College will see by examination that during the last two years he has lost nothing. The limb is now even stronger and better than it was then.

[The patient was then presented.]

Case II.—Alexander Johnson is in his nineteenth year. He states that his father and mother are healthy, and that he knows of no hereditary diseases in his family. One of his brothers, however, has enlarged and inflamed cervical glands. When about eleven years of age, while running down hill, he fell and bruised his right knee, but, after a few minutes, he was able to walk away. He continued to use the limb without much pain, but the knee became more and more stiff. He kept limping about on it for three years. One cold day he attempted to warm himself by standing near a steam-escape pipe. He went to bed that night feeling about as well as usual, but in the morning the pain had become so severe that he could not walk.

He was taken to the Pennsylvania Hospital, and remained in bed under treatment for about eight weeks. He was now able to make some use of his limb for eight months, although suffering severe pain. He was then admitted to the Presbyterian Hospital, and remained under treatment

by rest and counter-irritants for ten weeks. Upon leaving the hospital, he was able to walk with the aid of a cane. One day he fell into a stream of water, and kept his wet clothes on for several hours. The knee at once became more actively inflamed, and continued steadily to become worse. He was readmitted to the Presbyterian Hospital, and on the 26th of February, 1874, I excised the knee-joint.

A single straight incision was made across the front of the joint, and the extremities of the femur and tibia were sawn through and the patella dissected out and removed. The semilunar cartilages were found completely destroyed, and portions of the articular cartilages of the femur and tibia ulcerated, and in these spots the bones were carious; the disease of the patella and its cartilage had not progressed so far as that of the femur and tibia. The limb was placed upon a bracketed splint, and kept steadily in position by strips of adhesive plaster and a bandage. The wound was dressed with carbolized oil, and healed throughout nearly its whole extent by primary union. A small abscess formed on the inner side of the thigh, and discharged for several months by a long and tortuous sinus. Consolidation of the bones took place rapidly and in excellent position. In eight months he was able to go about on crutches, and soon after merely with a cane. For one year he has now walked easily and well without any assistance whatever, and his general health has greatly improved. He has been made night nurse in the men's surgical wards and is able to fulfil the duties with great satisfaction.

It is now more than two years since the operation. The wound has never reopened. The bones remain perfectly firmly united, and without any bending or bowing whatever. The shortening is three inches. He can walk long distances and do active work. He prefers to make use of an ordinary shoe without any addition to the thickness of the sole. He walks so easily and well, that nothing appears wrong except the inability to bend the knee.

Fig. 2.

As time goes on the usefulness of the limb continues to increase. The photograph (Fig. 2) has been taken two years after the operation, and shows the excellence of the limb.

[The patient was then presented.]

The result obtained in both of these cases is exceedingly gratifying, and the usefulness of the limb is far beyond that of any artificial support. Indeed there are no imperfections beyond the necessary ones of shortening and the stiff knee. These are not picked cases, but were taken as they came, and are the only ones in adults upon which I have as yet operated.

ON THE

THERAPEUTIC USES OF COMPRESSED AND RAREFIED AIR

(BEING A REPORT OF REMARKS MADE TO THE COLLEGE OF PHYSICIANS ON THE OCCASION OF A DEMONSTRATION OF WALDENBURG'S APPARATUS BY DR. JAMES TYSON FOR DR. WILLIAM PEPPER).

By

J. SOLIS COHEN, M.D.,

LECTURER ON LARYNGOSCOPY AND DISEASES OF THE THROAT AND CHEST IN JEFFERSON MEDICAL COLLEGE; ONE OF THE ATTENDING PHYSICIANS TO THE GERMAN HOSPITAL OF PHILADELPHIA, ETC.

[Communicated Feb. 2, 1876.]

I HAVE one of Waldenburg's instruments in use at my office, and should be very glad to have heard the results of Dr. Pepper's experiments as far as they have gone. For my own part I should require a much longer experience in the use of this appliance before committing myself as to its utility, although the reputation of Waldenburg, who is likewise the author of one of the best works on tuberculosis, is such as to command the most respectful consideration; and Waldenburg has, in his recent work on the pneumatic treatment of diseases of the respiratory and circulatory organs, advanced sufficient proof of the great value of this mechanical treatment in remedying certain physical defects unattended with organic change. In my own opinion emphysematous dilatation of the pneumonic vesicles from asthma and chronic bronchitis

would be the condition which would be most benefited by this method of treatment; and chiefly by forced *expiration* into *rarefied* air. The only instance in which I have as yet had a fair opportunity to test the value of the apparatus, apart from all other treatment, has been a case of emphysema with asthma, in a young lady who has suffered from asthma from her earliest recollection, and in whom the relief to respiration has been marked after each use of the apparatus, and in whom the vital capacity has increased from 1400 cubic centimetres to more than 1600 cubic centimetres in the course of one month. The use of compressed air is also indicated in cases of deficient expansion of the air-cells.

Inspiration of *compressed* air increases the intra-thoracic pressure, including of course that upon the heart and vessels; and the arterial walls are thus distended, so that the pulse becomes diminished in frequency, and full and hard at the same time. The treatment is indicated in dyspnœa from inefficient inspiration, whether cardiac or pulmonic, but it must not be pushed, lest it rupture the air-vesicles in delicate subjects.

Expiration into *compressed* air diminishes the quantity of air leaving the lungs, impedes the interchange of gases, and, if pushed, will produce apnœa. It is indicated in deficiency of normal expiratory power, to strengthen the auxiliary muscles.

Inspiration of *rarefied* air diminishes the amount of air inspired, diminishes the intra-thoracic pressure, and augments the external pressure on the chest. It enfeebles the action of the heart, and the pulse becomes soft, compressible, and more frequent. Pushed to

excess, inspiration becomes difficult; and apnœa may result, and even hæmoptysis.

Expiration into *rarefied* air increases the amount of air expelled from the lungs, and causes the chest walls to contract to a much greater degree than is possible by the most powerful voluntary expiratory effort. A greater amount of carbonic acid is expelled, and the succeeding inspiration is deeper and more refreshing. It thus increases the respiratory power, augments the vital capacity, and, in patients the walls of whose chests are still to some degree movable, tends to diminish the volume of emphysematous lungs and facilitate the restoration of the elastic contractility of the over-distended air-cells. The intra-thoracic pressure being diminished, blood accumulates in the intra-thoracic organs, and is withdrawn from the periphery of the body. The treatment is indicated in chronic bronchitis and in emphysema.

Thus from a study of the mechanical influences of augmented or diminished pressure upon the interior of the air-cells, and upon the intra-thoracic organs generally, we can judge of the propriety or impropriety of the practice in any given instance. Considerable caution is necessary in the use of such a powerful agent as compressed air, especially when inspiration is not supported by an equal amount of pressure on the exterior of the body as is the case in the compressed air-chambers, therapeutic apartments which apparatuses like that before us are intended to supersede. Where the pressure in the arterial system is already great, where there is congestion, or a disposition to congestion in important peripheral organs, as in

patients with internal hemorrhoids, menorrhagia, disposition to apoplexy, etc., the use of compressed air is strongly contra-indicated, no matter what may be the direct physical result desired in the intra-thoracic cavity. In converse manner, rarefied air, which draws the blood from the periphery to the central organs, is contra-indicated in all cases in which increased afflux of blood to the lungs is to be avoided, and in cases of insufficient pressure upon the arterial system already present, as in disposition to hæmoptysis, active congestion of portions of the lung-tissue, weak heart, and so on.

The efficient use of the apparatus before us, and all of the same kind, requires from fifteen minutes to half an hour each time that it is employed. It is evident, then, that it will not come into use in general practice, but is more applicable to hospital practice provided there are attendants who can devote a proper amount of time to superintend its use. For the reasons mentioned, it is hardly a safe apparatus to place in the hands of patients, for fear of the injurious results that may arise from its over-use. In the compressed air-chambers employed on the Continent of Europe for some thirty or forty years, the entire surface of the body is exposed to the same pressure, and thus a much greater amount of compression or rarefaction can be resorted to than in the use of an apparatus which limits the action to the respiratory surfaces. In the compressed air-chambers they use from three-sevenths to two-thirds of an atmosphere compression; with this apparatus we dare use but from one-eightieth to one-thirtieth of an atmosphere; and this is to be exceeded only with great circumspection. Still the portable

apparatus is to be preferred to the air-chamber because the remedial agent can thus be brought within the reach of the patient at his own home.

Some ten years ago, when engaged upon the first edition of my treatise on inhalation, I made some attempts to devise an apparatus for administering compressed air, and thus superseding the air-chambers. I first employed a kitchen bellows, then a condensing syringe and capacious reservoir, and subsequently a large acoustic bellows, but was unable to secure uniformity of compression, and this, with the lack of clinical material to work upon, led me to abandon the attempt; I was, however, very glad when I saw that others had succeeded, and in the edition of the work referred to which has just issued from the press, I have presented a succinct account of the subject, with illustrations of several forms of apparatus, including the one before the College. I would state, before concluding, that an apparatus in the form of an accordeon has been devised by Frænkel for the home use of the patient. The mouth being applied with the accordeon closed, the patient breathes into rarefied air as he expands the instrument; and, the accordeon being distended, he breathes compressed air as he closes the instrument. This I regard as very ingenious, but rather tiresome for patients; and I think that an apparatus to be worked with a treadle could easily be contrived to subserve the same purpose.

Finally, I would say, that there are some simple methods of increasing or diminishing the intra-thoracic pressure at will, without the aid of any apparatus at all, and which may be resorted to with advantage under appropriate circumstances. These are: (1)

Valsalva's method. A forcible movement of expiration, with mouth and nostrils closed, increases the intra-thoracic pressure, and has the same physical effect as the inspiration of compressed air; and the effect can be increased by external compression of the chest and abdomen; (2) Deep and prolonged inspirations with mouth and nose closed, will expand the chest and rarefy the air in the lungs, and the effect is the same as that of the inspiration of rarefied air; (3) Expiration aided by external compression of the chest and abdomen has an effect similar to that of expiration into rarefied air.

These movements may be occasionally substituted for the gymnastic exercises of the pneumatic apparatus, in cases in which the muscular efforts to produce them would not be injurious; but as a matter of course less effort would be required with the use of the apparatus, which will also fulfill indications for which the substitutes are incompetent.

[In connection with Dr. Cohen's remarks, Dr. John H. Packard reported the following case :—]

A boy four years of age was the subject of a very insidious attack of pleurisy of the left side, in February, 1875. The effusion into the pleural cavity was such as to produce the most threatening symptoms, and about four weeks after the beginning of the disease, with the consent of Dr. J. F. Meigs, who saw the patient with me, I drew off eighteen fluidounces of sero-purulent liquid by means of the aspirator. Great relief was immediately given, and there was no reaccumulation. The little fellow slowly recovered, but when the family went into the country, in May, the left thorax was still very much contracted, and the breathing on that side very imperfectly accomplished.

His father procured him a horn, and encouraged him to blow it, by way of salute to vessels passing on the river. The exercise thus afforded the muscles of the chest-walls was highly beneficial, and on the return of the family to town, in November, I found the thorax in excellent condition, the respiration on the left side being fully restored. The child's general health was perfect, and his appearance that of robust health.

[Dr. Cohen said :—]

The effect is similar to that recorded by Laennec, who saw good results sometimes in asthma, from making his patients count aloud as fast and as long as they could. This exhausted the residual air of the lungs, and was like breathing into rarefied air, and the subsequent inspiration was therefore more vigorous and effectual, and sometimes sufficiently effective to overcome the spasm.

NOTE

ON THE

ANATOMY OF THE PERINEUM.

By

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PROFESSOR OF COMPARATIVE ANATOMY AND ZOOLOGY IN THE UNIVERSITY OF PENNSYLVANIA, SURGEON TO THE PHILADELPHIA HOSPITAL AND TO ST. JOSEPH'S HOSPITAL.

[Read April 5, 1876.]

The perineum, used in the sense of that region which occupies the inferior outlet of the pelvis, is composed of two distinct elements, the splanchnic and integumental.

The splanchnic is represented in the pelvic fascia; the integumental in the external sphincter and transverse perineal muscles, superficial fascia, fat, and skin. It will be seen that the pelvic fascia is modified subperitoneal connective tissue. It should be described as distinct from the obturator fascia, which extends the entire length of the pelvic portion of the internal obturator muscle, terminating at the tuberosity of the ischium, where it is continuous through the falciform process with the great sacro-sciatic ligament. The continuity of these structures is of some significance when we learn that this ligament, as it is called, is in fact but little else than a fascial extension upwards of the biceps flexor muscle, and is made tense when the thigh is flexed on the trunk, and relaxed when both

the femur and the innominate bone are in the same line.

Two conclusions can be drawn from these premises: (1) that the biceps flexor, while aiding the semi-membranosus and semi-tendinosus muscles in maintaining the erect position, has also an important function not enjoyed by them of making tense the sacro-sciatic ligament in flexion of the hip-joint; and (2) that the tension of the ligament secures tension of the obturator fascia. Now the fascia in this way made tense yields an effective fixed point to the levator ani muscle. When the use of this muscle in the act of defecation is considered, viz., to support the rectum and to guide the direction of the pressure from above, it will be seen that the squatting position is the most natural one to assume in defecating, and that any interference with the play of the biceps over the tuberosity of the ischium impairs the efficiency of this act. The privy seat, which fixes the tuberosity in defecation, and the habit of relaxation of the parts above described, acquired by resorting to this questionable accessory of the modern dwelling, may be looked upon as related causes of many phases of passive congestions of the pelvic organs, and particularly of those leading to internal hemorrhoids.

CASES

ILLUSTRATING LOCAL INJURIES OF NERVES AND THEIR TROPHIC CONSEQUENCES, WITH COMMENTS.

By

S. WEIR MITCHELL, M.D.,

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[Read May 3, 1876.]

The present state of uncertainty as to the existence of trophic nerves makes unusually interesting every example of lesions giving rise to altered nutritive states. On this account chiefly the following cases may prove of use. They have also a novel value owing to the fact that, in several of them, careful maps have been made of the loss of sensation. I shall read them in turn, with such comments as they seem to me to suggest.

For Case I., I am indebted to Dr. J. B. Crawford, of Wilkesbarre. It is one of almost unique rarity.

Case I.—James Graham, a night watchman, was wounded by the accidental discharge of a pistol, on the night of January 29, 1871, the ball entering the anterior part of the arm, passing obliquely downward and backward through the belly of the biceps flexor muscle, and making its exit on the posterior aspect of the limb, about one and a half inches nearer

the distal extremity of the limb than the point at which it entered.

Profuse hemorrhage followed the reception of the wound, but was controlled by the application of a compress and bandage, and no unusual features were observed, at that time, by the surgeon in attendance. The patient seemed to be doing well until February 9, when secondary hemorrhage occurred. This was again controlled by a compress until the 12th, when a recurrence of bleeding took place. A compress was again applied, followed by another hemorrhage on the following day. Recourse was now had to acupressure, by which means the hemorrhage was restrained during the next eight days, but about twenty-four hours after removing the needle, bleeding again occurred.

An incision was now made at the point of entrance of the ball, and a false aneurism of the size of a hen's egg was found, having its origin in a small opening on the posterior aspect of the brachial artery, and communicating with the wound. This was emptied, and ligatures were placed upon the vessel, both above and below the opening. The wounds of entrance and exit seemed to indicate that the missile in its course through the arm must have grazed the humerus, but no denuded nor detached portions of bone were observed at the time of the operation.

Slight numbness of the forearm and hand were noticed soon after the reception of the injury, and steadily increased as the case progressed. The pain also, at the seat of injury, which at first did not seem excessive, steadily increased in severity, and at length became exceedingly intense.

The hygienic conditions of the patient's apartments were of the most unfavorable kind. This, coupled with the large and repeated losses of blood, doubtless disposed the case to an unfavorable termination. Suppurative inflammation invaded the entire limb. Several abscesses formed about the elbow and in the forearm, and excessive suppuration took place about the incisions made for the purpose of applying the ligatures; no further hemorrhage occurred, but the

patient's condition gradually became worse; symptoms of pyæmia supervened; and death took place on March 19, forty-nine days after the reception of the wound.

At the post-mortem examination, made on the following day, the tissues of the arm were found greatly infiltrated with pus. Closure of the ligated ends of the artery had taken place. No connection between the severed ends of the brachial artery could be discovered, and the circulation through the limb seemed to have been very imperfectly and inadequately carried on.

The surface of the humerus was found to be denuded of its periosteum for an inch or more in extent, at a point corresponding to the line of the wound, and a portion of the bone had evidently been detached. No appearances of repair could be seen. Had the patient lived somewhat longer, necrosis of a considerable portion of the bone would evidently have occurred.

A longitudinal portion of bone was found attached to the sheath of the median nerve, at a point in close proximity to the seat of the original wound. A portion of this bony mass, with the nerve to which it is attached, is shown in the accompanying specimen.

[Specimen shown.]

One end of the mass, about one-third of an inch in length, was removed in making a section for microscopic study, and was not preserved.

An examination of the specimen shows its firm attachment to the nerve-sheath, and a microscopic section gives evidence that this fragment of bone was in process of growth. At least the comparative sizes of the canaliculi (those near the surface being larger than those near the central portion) would seem to warrant such a conclusion.

This case seems to me unusual and interesting. Verneuil (see page 112 of my book on Injuries of Nerves) reports a case of a fragment of periosteum

carried away by a ball and lodging on a nerve, where it developed bone. On page 216 I reported a case of wound of the left infra-maxillary branch of the fifth nerve from a splinter of bone broken away from the right side of the lower maxilla, and carried across the mouth by the ball.

The next case was seen in consultation with Dr. L. K. Baldwin.

Case II.—Robert Cooper, æt. 9, in August, 1873, broke both bones of the forearm close to the elbow. The fracture was compound, and the injury grave. A slough occurred on the front of the forearm; but beyond this the early history is incomplete.

When seen by me, February 27, 1874, there was a cicatrix four inches long down the middle of the forearm; and owing to it and to the neural changes, motion was lost or limited as follows: Extension of forearm limited one half; pronation and supination lost; wrist motions lessened by joint lesions and loss of power. The fingers were set in the form of a claw, there being slight power to extend the second and third phalanges, but no other finger motion.

Sensation as to touch was lost entirely in the median territories, was deficient in the ulnar region, and altered in the radial region. The face of the lower half of the forearm was hyperalgesic, and here, as well as in the whole palm, in parts of the fingers, and over most of the dorsum, every touch was felt as pain. This pain was a burning, with radiation downwards, or laterally and downwards. There was also an incessant torment of burning pain.

The hand-muscles were wasted, and the thumb rotated outward, so that the nail lay in the same plane with the nails of the fingers.

The whole hand, especially the fingers, was dusky red, swollen, and as smooth and glossy as if polished.

The nails were curved like turtle shells in all directions, roughened, dark, and elevated as if by the overgrowth of

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subjacent tissues; the matrix in all of them was separated from the nail and ulcerated.

On the back of the hand was an irregular stellate deficiency of pigment, not due to original defect or to a scar.

The treatment consisted in the use of numerous successive blisters to the hand and fingers. Under these the sensitiveness entirely disappeared in about three months. Then the arm and hand were faradised and thoroughly *masséed* every day, and at last the joints were moved by degrees, and cautiously. As to results, within a year I had the pleasure to see the lad regain every movement and all the lost sensation. The hand is now painless and useful.

This case shows well what can be done when we have youth on our side, and the revolutionary aid of growth. Causalgia, neuro-arthritis, excess of callus, tendons tied down and fixed in their inflamed sheaths, atrophy, and ulcerated nails, would make in the mature adult a case to be amended, possibly, but not to be cured.

The accompanying chromo-lithograph well represents the hand except as to the glossy skin.

The next five cases are examples of injuries of the median nerve, all being, I believe, complete or partial sections as yet unrepaired. Each case is accompanied by diagrams of the regions of lost and lessened sensation, prepared with unusual skill and care by Dr. Neff, the resident physician at the Infirmary for Nervous Diseases.

Case III.—Robert Harbison, æt. 47, applied for treatment March 1, 1876, at the Infirmary for Nervous Diseases. Four months ago he received a cut across the anterior surface of the wrist from a piece of glass, which divided the flexor tendon of the forefinger and the median nerve. There was free hemorrhage, but probably no vessel of any size was divided, for the patient says that at the Episcopal Hospital, where he was taken, the doctor applied no ligature, but

brought the edges of the wound together with stitches, and placed the hand upon a splint. The hand was upon the splint for ten days, and when the latter was removed the patient found that he could not flex the forefinger, and that there was loss of feeling in this finger and in the thumb and middle finger, but no pain. Six weeks ago, what he describes as a water blister appeared on the forefinger, and when the contents were evacuated an ulcer remained which healed in about a week. Several other blisters formed on the middle and forefingers, and ran about the same course as the first.

Fig. 1.

Fig. 1.—Palmar surface of hand in case of Robert Harbison. The light shading represents loss of sensation to touch of feather; dark shading, to touch of needle. The arrow-heads represent the position at which the compass points are distinguished as two, the distance being given in lines.

Present Condition—There is anæsthesia in the thumb and fore and middle finger, as shown in the diagrams (Figs. 1 and 2). A cicatrix extends across the front of the wrist. There is

an elevation of the scar as large as a filbert about the middle, but there is no tenderness on pressure. There is on the middle finger a deep, dry ulceration about half an inch in diameter, at the site of a blister which appeared a week ago. Several

Fig. 2.

Fig. 2.—Dorsal surface of hand in case of Robert Harbison.

scars on the fore and middle fingers show where other ulcerations have been. There is no glazing of the skin nor other change in the nutrition of the affected parts. The patient can flex the first phalanx of the forefinger, but not the last two. Electro-muscular contractility good in the muscles of the forearm, but absent in the median muscles of the thumb.

April 26.—Patient has not been seen for some weeks. He has been working and using the hand for various purposes, but there is no improvement in the sensibility of the affected fingers and thumb. The middle finger is considerably enlarged, and the skin seems thickened and hard. The ulcerations have continued to form, and there are at present a

deep, recent ulcer upon the ulnar side of the middle finger near the extremity, another upon the radial side near the second joint, and a third, almost healed, upon the end of the index finger. These ulcerations seem to begin as bullæ half an inch in diameter, which suddenly form, and in a short time rupture, leaving deep ulcers with well-defined edges. There is but little discharge of any kind, and the ulcers heal in a week or ten days.

For two or three days past there has been pain throughout the hand, but it has not been acute. No improvement in flexion of the forefinger. The extent of loss of feeling does not accord with the plates in the Anatomies, nor exactly with that of the certainly divided nerve in Case VII.

The nutritive changes described are not rare, bullæ being among the most common, but the dry, non-discharging ulcers, looking as if cut out with a punch, are peculiar and most singular in appearance. They occur here after total section of one nerve, but on territories which are probably not altogether isolated from neural influence, owing to the curious anastomoses of terminal nerves in the hand and fingers, so that section of one nerve seems to have the power, even when complete, to cause, in some way, irritative conditions in the territory which it supplies, and in order to do this it seems necessary to have still related to the region entire nerves; for in the few cases I have seen of total nerve sections of all the nerves of a part, these phenomena are not seen, and we have only muscular degenerations, dry and scaly skin, and œdema.

Case IV.—Bella H., æt. 17. Clinic of Dr. Sinkler. On February 11, 1876, while going down stairs with some bottles in her hand, she fell, and, a bottle breaking, one of the fragments ran into the palm of the right hand. The wound bled considerably, but the hemorrhage was checked by a

piece of clothes-line being tied around the wrist, and she immediately went to a drug shop in the neighborhood, where the rope was removed and some application made to the wound. There was no search made for glass in the cut.

The first sensation experienced by the patient, after the injury, was a feeling of numbness in the hand, and this was observed before the rope was tied around the wrist; when the edges of the cut were pressed together by the druggist she noticed that she did not feel it. For the first two days there was an aching pain in the hand and arm, and any movement or touch of the hand caused a sharp pain to shoot into *all* of the fingers, but within a week the pain on movement became confined to the thumb and index and middle fingers. For the first week she thinks that there was complete anæsthesia in the thumb, forefinger, and radial side of middle finger, but the thumb and middle finger have since gradually improved as to sensation. The only movement lost at first was flexion of the forefinger.

In two weeks the wound had united except at one small point, and that soon healed under the care of Dr. Nancrede, at the Episcopal Hospital, to whom we are indebted for the case and its history.

No nutritive changes were observed in the hand or fingers until a week after the wound had cicatrized, when a "water blister" appeared on the forefinger, involving the entire cuticle except over the dorsum of the first phalanx. She says that the finger looked as if it had been dipped in boiling water. In about a week the epidermis was removed by Dr. Nancrede, and as the nail was detached except at the base, he removed most of it. The surface of the finger was left looking raw, and it is only about three weeks since the skin has been renewed. When the cut healed, the cicatrix became extremely sensitive to the least touch, and this hyperæsthesia has increased, as well as the pain caused by movement of the hand. Four weeks ago the patient was taken ill with pneumonia, and is just convalescent.

Present Condition.—April 23, 1876. There is a cicatrix nine lines in length, running obliquely upward and outward

across the palm of the hand, beginning at a point one and a half inches from the middle of the first metacarpal bone. The appearance of the hand is normal, except that of the forefinger which tapers unusually towards the end. The skin of this finger is shiny, and of a mottled, purplish hue, save over the back of the first phalanx. The nail is four lines in length, that of the left forefinger being six lines, is ridgy, thickened, and detached for some distance from the end of the finger. The skin over the radial side of the middle finger is also somewhat mottled and purplish.

Motion.—All the movements of the three last fingers are perfect. Extension of the index finger is good, and the patient can partly flex the first phalanx, but flexion of the

Fig. 3.

Fig. 3.—Palmar surface of hand in case of Bella H. Signification of shading and arrow-heads, as in Fig. 1.

last two is impossible. The thumb is somewhat drawn across the palm, and although flexion and extension are present, they are limited by the pain caused by any movement. The

median thumb muscles respond to electric stimulation of the main nerve in the forearm. The condition of adduction of the thumb seems to be owing to disease.

Sensation.—Slight pressure over the median nerve at the wrist, or at the bend of the elbow, causes pain in, but not beyond, the cicatrix. Deep pressure at the wrist causes pain as far as the first joint of the forefinger, and not in the thumb. Generally there is no pain while the hand is at rest, but sometimes there is dull pain which lasts for a while after the part has been disturbed. Occasionally there is a short acute pain in the hand while at rest. Moving or hand-

FIG. 4.

FIG. 4.—Dorsal surface of hand in case of Bella H.

ling the thumb causes great pain, and at times, when the forearm is extended, pain is felt in the hand. The cicatrix is exquisitely sensitive. Loss of sensation is complete in the forefinger, so that a needle may be thrust to the bone without being felt. On the radial side of the middle finger, and on the ulnar side of the thumb, there is no analgesia, and only

loss of sense of feather touch. For further particulars as to loss of sensation, see the diagrams (Figs. 3 and 4).

The nutritive changes resemble those of Case III. Comparing the diagrams, it is probable that the section was very nearly complete. In this, as in other cases, some time elapsed before the trophic changes were manifest, so that as it is sure they did not result from injuries, more or less time is seen to be needed before the conditions which cause irritative states of skin can be brought about. These are probably due to the remote alterations of the nerve tubes known as Wallerian degeneration, and which are of slow evolution, and do not become complete for some weeks.

It is stated above that pressure on the median at the wrist causes acute pain, referred physiologically to the fingers isolated by the section; as the point of pressure retreats up the arm, this becomes less marked, and at the elbow moderate pressure only causes pain down the nerve and at the site of the wound. It is plain from this that the nerve trunk has become over-sensitive, and either that disease is travelling up it, from the part cut, or that the sensorium is being by degrees *sensitized* into a state of irritability which causes it to respond excessively to slight stimulations. This condition is apt to arise from any long-continued irritation of a sensitive nerve, and the next stage is the reflection of a like sensitiveness on to nearly or remotely related groups of ganglia, so as to cause secondary neuralgias.

No doubt this is a frequent pathogenesis; but I do not think the sensitiveness of the nerve trunk can always, or need always, be explained by acquired irritability

of its central sensorial ganglia, or by the upward passage of coarse lesions. I myself believe that a length of nerve trunk may itself become suddenly, or at least rapidly, sensitized, so that a touch or slight pressure may cause pain. This may come about owing to irritations at any point of its course, which alter the character of those polar changes which constitute its conductive capacity. This is seen in Waller's experiments on freezing the ulnar nerve, which I have repeated on myself. As the nerve thaws, and then like other tissues becomes congested, a tap over it will be felt in all its ramifications, and will throw into violent movement every muscle which it supplies.

In this case the muscular branches to the thumb and interossei are entire, and some of them are kept in a state of irritation which is seen in a constant bilateral oscillation of the index finger.

Case V.—Margaret Kelly, æt. 50, domestic, came to Infirmary for Nervous Diseases, clinic of Dr. Sinkler, March 28, 1876. Says she has always been healthy, and never has had rheumatism.

In the afternoon of December 22, 1875, she was seized with a violent, "jagging" pain in the right thumb. She could account for this in no way, except that having been, that morning, cutting meat with a very dull knife, she had been obliged to bear a great deal of weight upon the knife, and the back of the blade had pressed obliquely across the palm of the hand between the thumb and forefinger.

The pain in the thumb increased in severity, and the next day the part swelled. Soon the whole hand became swollen, and the swelling then extended up the arm, giving the limb the appearance of erysipelas. The intense pain in the thumb subsided in three or four days, but the whole arm was painful, and there was a numb feeling in the thumb and forefinger. The swelling of the arm and hand continued for more than

a month, during which time she could not stir the hand at all. About six weeks ago she went to Dr. Carter, at the Northern Dispensary, under whose care the swelling gradually subsided, when Dr. C. advised her to come to us for the trouble which remained. When the swelling had disappeared, the patient found that her fingers were so contracted that she could move them but slightly. There has been no pain in the arm or hand for several weeks.

Two weeks ago a "water-blister" appeared on the inner side of the end of the index finger. It healed in about ten days. About a week ago another blister came on the extremity of the same finger, and this left an ulcer, about three lines in diameter, which has not yet healed.

Fig. 5.

Fig. 5.—Palmar surface of hand in case of Margaret Kelly. Signification of shading and arrow-heads, as in Fig. 1.

Present Condition.—The flexor tendons of the right fingers are contracted, so that extension of the fingers is limited. The whole hand has a glazed and shiny appearance. The

finger-nails all show transverse ridges, as though their growth had been retarded at one time, but this is most conspicuous on the thumb, and on the fore and middle fingers. There is loss of sensation in the thumb, and fore and middle fingers, as shown in the diagrams (Figs. 5 and 6). The loss of feeling is here incomplete but large. There is no pain on pressure over the median nerve in any part of its course. Electro-muscular contractility normal.

Fig. 6.

Fig. 6.—Dorsal surface of hand in case of Margaret Kelly.

This case was probably, as the diagrams show, one of incomplete loss of nerve power in the median; on the palmar face of the second digit, and the dorsal aspect of the second and third fingers, it was entire. The trophic changes need no comment.

The next case was brought to my clinic by Dr. T. D. Ingram, to whose kindness I am in debt for the following history :—

Case VI. *Section of the Median Nerve, followed by loss of Sensation and Motion.*—On March 22, Henry W., while going hurriedly to the basement, made a misstep on the stairway, and put his hand forward to reach the lintel above a door, which stood at the bottom of the stairs, to recover himself from falling; but missing the support, he thrust his hand through a broken pane of glass, that formed the upper part of this door. He thus fell with considerable force, sustaining three lacerated wounds of the forearm, only one of which, however, was of much depth. This wound, which I saw soon after the accident, was parallel and close to the inner side of the tendon of the palmaris longus, and extended from the fold at the wrist, just above the anterior annular ligament, about one and a half inches. There was considerable hemorrhage, but no jetting of blood; and the tendon of the palmaris longus was plainly exposed, but not divided. I examined the wound somewhat carefully, to see that no foreign matter was lodged in it, and finding none, closed it by interrupted sutures and intervening adhesive strips.

I saw the wound two days afterwards, and removed the sutures, trusting to the adhesive strips to keep the parts in apposition. Nothing of note appeared to take place for a week, save the slight gaping of this wound, and also of one higher up the arm, which gaping I attributed to my too early removal of the sutures.

Eight days after the injury the patient called upon me, complaining of a numbness of his fingers, etc., which, upon questioning, he recalled had gradually increased since the accident. The thumb, forefinger, middle finger, and ring finger to some extent, presented an œdematous appearance, were of a livid hue, and perceptibly cooler to the touch than other parts of the hand. The epidermis appeared to be thickened and lustreless, especially on these fingers, both back and front, and on the part of the palm corresponding to them.

It was now quite evident that there was some accident to the median nerve. I made an examination, and found a

complete loss of sensation to harsh pricking with a sharp pocket probe, over the region described above, and, more minutely, in the accompanying diagrams (Figs. 7 and 8). This testing was repeated at intervals, with care, and the result noted: it was found that the region at first totally insensible, gradually diminished, or, in other words, that there was a partial return of sensation on the border, to wit, a large part of the palm, palmar surface of the thumb, and radial half of the ring finger.

Fig. 7.

Fig. 7.—Palmar surface of hand in case of Henry W. The shaded portion represents the region of lost sensation, March 30, 1876.

No other nutritive disturbances have been observed, except the formation of a small abscess at a point, accidentally pricked with a pin, on the forearm, and the discharge of considerable pus from one of the smaller wounds before its healing; but as these were situated above the nerve lesion, they probably did not depend upon it as a cause.

The patient, though somewhat annoyed by the condition

of his hand, and the slight abscess developed, has enjoyed fair health. He has been taking a tonic of iron, quinia, and strychnia, with liberal diet. A tendency for some days to slight febrile disturbance, seemed to be dispelled by attention

Fig. 8.

Fig. 8.—Dorsal surface of hand in case of Henry W., March 30, 1876.

to the solubility of the alvine evacuations. He was directed to rub and manipulate the fingers frequently and regularly, thus to promote the circulation in them. There has been very considerable improvement in their appearance, as well as in the ability to flex and extend them; but this is as yet quite limited. The affected part of the hand, especially the thumb muscles, have slightly wasted.

It was noticed, on snipping a slight elevation in the cicatrix, that he felt a twingeing sensation, similar to that experienced in the little finger from concussion of the ulnar nerve behind the internal condyle of the humerus; but in this case it was quite accurately referred to the other fingers; the point very probably indicated the proximal extremity of the divided

nerve, the sensation being a referred one to the parts originally connected.

April 24.—Dr. Weir Mitchell kindly consented to see the case at the Infirmary for Nervous Diseases, and his very careful examination confirmed the preceding observations. Upon testing, the electro-cutaneous sensibility and the electro-muscular contractility were found to be greatly diminished in the median palmar region, the thenar mass of muscles being scarcely sensitive to a powerful galvanic current.

It is possible that, if a section of the median nerve had been suspected when the wound was open, and the divided ends approximated by suture of the nerve sheath, a more favorable prognosis could be entertained; but the exact linear direction of the wound, with but little disturbance of the surrounding tissues, although it extended through the deep fascia, exposing the superficial tendons, did not suggest so important a lesion.

Fig. 9.

Fig. 9.—Palmar surface of hand in case of Henry W., April 26, 1876. Signification of shading and arrow-heads, as in Fig. 1.

The case will be kept under careful observation, its changes noted, and reported in time.

In the early stages of this case the whole median area was cut off by what was probably a nearly complete section, with inflammatory changes in the uncut portion. As these declined the area of feeling widened. It is possible, however, that the nerve was cut clean across, and that in this, as in other cases, the median territory is smaller than usual. Figs. 9 and 10 represent the areas of lost or lessened feeling at the thirty-sixth day.

Fig. 10.

Fig. 10.—Dorsal surface of hand in case of Henry W., April 26, 1876.

Case VII. was related by me in the American Journal of the Medical Sciences for July, 1874, and for April, 1876. I give its final diagrams (Figs. 11 and 12) only as a means of comparison, since in it the median was cut by the surgeon.

This case offers, with Cases III. and V., a good illustration of the varying amount of surface supplied by the median nerve in different persons. It is interesting to compare these diagrams with those of the Anatomies.

Fig. 11.

Fig. 11.—Palmar surface of hand in Case VII. B B, region of lessened touch, and B' B', of slight lack of touch, on March 2, 1873. At that time there was loss of pain and touch in all the region marked by dark shading, and loss of touch only in the lightly shaded areas. The shading and arrow-heads show the condition in April, 1876, having the same signification as in Fig. 1. Hyperæsthesia in space marked H.

I may add that, as these diagrams show, three regions of disturbed feeling may be made out: First, a part marked by darkest shading where the prick of a fine needle is unfelt; second, a region lightly shaded, beyond this, where the touch of a feather is unfelt, but where the needle is recognized as painful; and third, a

wider space often running far into the ulnar territory, where both are distinguished, but where the limits of confusion of the compass points are unusually wide, or where the compass points are felt as a single touch or point. Lastly, in most complete nerve sections, the

FIG. 12.

Region in which pain and touch were lost in March, 1873.

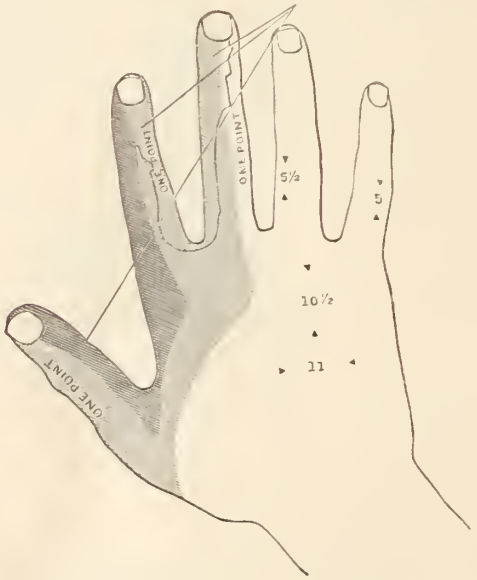

FIG. 12.—Dorsal surface of hand in Case VII., April, 1876.

disturbance of feeling is apt at first to extend far beyond the nerve involved, and to gradually or speedily shrink to the normal territory. The cause of this first and wider loss must be due to disturbances caused by the section in closely related ganglionic groups of the sensorium. This is well seen in Case VI.

For these reasons repeated mapping is needed at intervals, and to illustrate this I have given two sets of diagrams of Dr. Ingram's case.

Case VIII.—P. S., æt. 37, laborer. This man presented himself at my clinic February 27, 1874. A year before he had a large and painful abscess in the right axilla. There was much swelling of the arm and hand, and acute pain down the nerve trunks to the fingers. This was followed after some months by lessened sensation in the hand, which has now returned almost entirely, there being still some loss at the finger ends as measured by the æsthesiometer. The pain disappeared after the fourth month.

The hand began to swell at a date which he cannot fix distinctly. It presented, when first seen by me, a most singular appearance. There was, on the dorsum, very slight œdema, but none elsewhere. The whole hand was twice its natural size, and the fingers were strangely enlarged, and tapering to the ends, where there was little change. The thickening was, as I have said, not œdematous, and did not pit on pressure. It was firm and hard, apparently from a brawn-like alteration of the areolar tissue, which almost destroyed its movements.

The skin was dry and yellow, and covered with flakes of ragged epithelium. All the nails were curved and ridged transversely, and the matrices were separated from the roots of the nails. He had had renewed pain in the hand for two days, but no redness or tenderness. The arteries were patent. He had never had syphilis, and, saving the state of the hand, had enjoyed unusual health. He said that the swelling underwent rapid changes, and that at times it was much less.

I could not find any nerve lesion in the arm, and the nerves were not tender except slightly in the axilla.

This case I lost sight of after seeing it but twice, and this is to be regretted because it is, as far as I know, the second recorded case of areolar hyperplasia from nerve injury. The first may be found on page 167 of my book, and it also was one of axillary wound.

These two cases well illustrate the extreme difficulty of explaining the pathogenesis of tissue change from

nerve lesions. We may have, from injuries seemingly alike, joint diseases, or glossy skin, or herpetic eruptions, or circumscribed blisters, or deep ulcers, or altered nails, œdema, atrophy, or hypertrophy. The circumstances which regulate the production of these several pathological states are as yet unknown to us. At present we can only confess our ignorance.

HYSTERICAL AFFECTIONS OF THE EYE.

By

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[Read June 7, 1876.]

THOUGH the term "hysterical" is a vague and indefinite one, which most of us would rather not be called upon to accurately define, still it has a conventional meaning, and, by common consent, is made to include a large class of cases in which there may be decided or even alarming symptoms without real disease. The expression is used here in its broadest sense, as it is not my intention to undertake a discussion of psychological pathology, but merely to call attention to a class of eye symptoms which I believe are not sufficiently dwelt upon in the text books, and which I feel sure are very often misinterpreted in practice. I have more than once met with interesting, but rather mysterious, cases which had been reported in good faith by experienced surgeons, but which seemed to me to be clearly of this character; and, without doubt, a large proportion, if not all, of the magical cures of blindness by galvanism, that we occasionally hear of, may be referred to this class of cases.

The hysterical affections of the eye that have come

under my notice have appeared to me to include three kinds of patients.

I. Those who are the subjects of a kind of moral insanity, or, at any rate, of an insane perversity; who deliberately simulate a disease for months or years; who, in short, may be called hysterical malingerers; and who to be cured need only to be exposed.

II. Those who really believe themselves to be affected as they profess to be, and are honestly anxious to be cured; who are subjects of hysterical paralysis; and whom it would, perhaps, be unjust to accuse of acting a part.

III. Those who are subject to irregular nervous action, to paralysis or spasm without assignable cause, but in whom there is no question of mental or moral complication.

I reported several instances of the first class, and gave the various means that have been resorted to for their detection, in an article on "Simulated Amaurosis" in the American Journal of the Medical Sciences for October, 1873. One case, as a good illustration, may be reproduced here.

Two years ago a girl eleven years of age, apparently in excellent health, was brought to me by her parents with the statement that they had recently discovered her left eye to be quite blind. She had been sent to the family physician, a homœopathic practitioner, on account of a slight conjunctivitis, and, as the result of the consultation, had returned with this startling announcement. She denied even perception of light in that eye.

Never having met with a similar case, I failed to detect, or even suspect, the deception, but as a careful ophthalmoscopic examination revealed no lesion or imperfection of the organ, I assured the girl's parents that there was no present

disease there, and no indication for treatment. The other eye was found to be perfect in all respects, and I advised them to return her to school and pay no attention to the blind eye while the sight of the other remained unimpaired.

A few weeks since she was again brought to my office, complaining that the other eye was failing, the left still continuing stone blind. She said that the print looked blurred when she attempted to read, and her parents had noticed that she held the book nearer to the eye than usual.

She admitted a vision of $\frac{20}{L}$ and with a $-\frac{1}{18}$ glass acknowledged to $\frac{20}{XL}$. A central limitation of the field of vision was very well counterfeited. The result of a careful ophthalmoscopic examination was entirely negative. While I was engaged in recording her case, she amused herself by looking over the trial glasses, and announced that the plain blue glass made a great improvement in her sight. This being the only discernible indication for treatment, I ordered blue glasses; but not finding the large blue coquilles, with which the optician furnished her, becoming, she, at the next visit, denied that they were of any use. When directed to look at a distant gas flame through a prism with its base upwards, held before the right eye, she at once acknowledged the double images, but when the attempt was made to separate the images by means of a colored glass, her suspicions seemed to be aroused, and her answers were negative. When required to read the test letters at varying distances there were evident discrepancies in her answers.

The pretended amblyopia of the right eye precluded the use of any of the tests for monocular blindness based upon the reading of ordinary type, and confined me to the large letters which she had acknowledged being able to recognize. I, therefore, placed the trial frames before her eyes with a plain glass in the left side, and a convex one of ten inch focal distance in the right. The latter, without exciting her suspicion, excluded the right eye from any distinct

vision beyond the focus of the glass. She still read No. L at twenty feet. Then, having first substituted for the test card another with a different series of letters, I placed an opaque disk in front of the plain glass, and she could not make out a letter. This proved, at least, that she had been reading No. L, at twenty feet, with the eye that she pretended was not conscious even of the bright glare from the ophthalmoscopic mirror, and was quite enough to justify a complete distrust of all her statements.

She did not appear again, but her father called on me some days afterwards and reported that she had come home in a very bad humor, indignantly accusing me of having treated her with great injustice, but, the next day, had made admissions which, though partial and constrained, were sufficient to convince him of the correctness of my view of her case.

This form of hysteria is the only one usually referred to in works on ophthalmic surgery.

The following case of simulated monocular diplopia is, I believe, unique:—

An unusually bright little girl, ten years of age, was brought to me by her father, who said that she had been troubled with double vision for two weeks. The symptom first appeared in a very crooked copy in her writing lesson, had since been constant, and had disturbed her sight so much that she sometimes stumbled as she walked, or ran against people in the street. There was no evident disturbance of her health, but she complained of occasional frontal headache and sleeplessness, stating that she heard the clock strike nearly every hour during the night. She said she was never free from the double vision except when the right eye was closed; that closing the left eye made no difference.

Examination of the eyes gave the following result: Left, $V = \frac{20}{XXX}$, and in all other respects quite normal. Right, $V = \frac{20}{CC}$; no improvement by glasses of any kind. When

tested with the candle, two distinct images of the flame side by side, separated by a narrow but well-defined space. Field normal, and double images the same in all directions. Neither the use of a stenopaic hole, nor complete atropinization, produced any effect on this symptom. The media were perfectly clear, and the ophthalmoscope showed an emmetropic refraction and a typically normal fundus. The patient's manners were so perfectly childlike and ingenuous that I was completely puzzled, and merely assured her father that I had been unable to detect any disease, and asked him to bring her again in a few days. In thinking over the case after she had gone, the symptoms seemed in such entire defiance to the laws of physiology and optics that they could not be real. I mentioned my suspicions to the family physician, Dr. Ellwood Wilson, and he at once acted upon the hint. The little patient was carefully watched during the night, and found to sleep calmly and quietly without interruption. Directions were then given that she should not be allowed to use her eyes for an instant either in work or play, and that whenever there was the slightest warning of headache, she should at once be sent to a darkened room to remain until the pain disappeared. This regimen was too much for her active mind, and she soon announced that the two objects were coming closer together, and that she should not be surprised if they were to go into one. In a few days her father called at my office to say that all trouble had disappeared.

Almost any derangement of vision may be counterfeited. A little girl of eight years complained that every object that she looked at seemed covered with diagonal white lines, the direction of which she indicated with her finger. As the ophthalmoscope revealed a normal fundus, a favorable prognosis was given. This was made more positive the next day, when the white lines changed to blue, and was justified by the early disappearance of the difficulty.

In the second class of cases we have more or less retinal anæsthesia with anomalous and variable symptoms changing, perhaps, at each examination. The following case may afford an illustration:—

Miss A., aged about twenty, lived some distance from town, and was seen only at comparatively long intervals. The diagnosis was made easy by a very well-marked hysterical history. The first record is: Right eye, V $= \frac{15}{XL}$, Left $\frac{15}{XXX}$. Both eyes emmetropic, and ophthalmoscopic appearances perfectly normal. Accommodation deficient and irregular. She was ordered $+ {}_{2}^{1}{}_{4}$ for reading, which seemed to give great assistance. At the next visit, vision had diminished to $\frac{15}{C}$. Soon afterwards there was a partial limitation of the field of vision with V $\frac{15}{LX}$ at the periphery and less than $\frac{15}{C}$ at the centre. A high degree of photophobia was now added to the symptoms. In a few days more the amblyopia had still further increased, to an extent that gave the greatest alarm to her friends, whom it was difficult to convince that she was not drifting into hopeless blindness.

After this time she did not appear for three months, when she reported that her sight had improved so much that she had been able to read and sew with the aid of the glasses, but that it had again grown much worse. She could now make out No. C not further than six feet, and that for a few seconds only, when the sensibility of the retina seemed to be exhausted. When the eyes were fixed upon an object a foot distant, it was soon lost to view entirely. There was also a high degree of insufficiency of the internal recti.

Having now pretty nearly exhausted the list of available symptoms, the patient stopped short of complete blindness, and, without special treatment, gradually but entirely recovered.

In the third class of cases the parts affected have been the retina, the muscle of accommodation, the external muscles of the eyeball, and the elevator of the upper lid.

It is not very uncommon to meet with patients who have apparently perfect eyes and full acuity of vision, but who say that the test letters become blurred and unrecognizable after they have looked at them for a few seconds. That this is due to an exhaustion of the sensibility of the retina which disables it from the sustained performance of its function, and not to an irregular action of the accommodation, is shown by the fact that it persists when the eye is fully under the effects of atropia.

A partial failure of the accommodation may occur in nervous persons, either alone or in connection with other symptoms. Very satisfactory results may sometimes be obtained from the use of weak convex glasses, in the case of ladies who are quite young and entirely emmetropic. Exception may be taken to including the opposite condition of accommodative spasm among hysterical affections, because it usually occurs in connection with some error of refraction. In a very large proportion of cases, however, the subjects are delicate women, and the error of refraction is a very slight departure from the normal standard, such as would not be felt by a person of fair average strength and nervous equilibrium. In other words, it is only the exciting cause, a strong predisposition existing in the temperament of the individual.

These cases are of quite frequent occurrence in ophthalmic practice. The following is a good illustration :—

An intelligent but delicate school-girl, fourteen years of age, just before the first appearance of the menses, complained that she was growing more and more near-sighted, could not recognize people in the street, and was obliged to hold the book very close when reading. Vision without glasses was found to be only $\frac{20}{c}$. Concave glasses of eight inches focus brought it up at once to $\frac{20}{xx}$, but, in a few seconds the partial closing of the eyelids and corrugation of the brows showed that this acuteness of vision was gained at the expense of considerable accommodative strain. The ophthalmoscope revealed a perfectly normal fundus and a refraction nearly emmetropic. Under atropia it was evident that there was not only no myopia, but a slight degree of hypermetropia, and $+\frac{1}{4}\frac{1}{2}$ brought vision up to the normal standard. This might fairly be called a case of hysterical myopia.

Irregularity in the action of the external muscles of the eyeball, particularly insufficiency of the internal recti in convergence, is not uncommon in patients of this class, and frequently complicates their other ailments. A young married lady, a painfully hysterical subject, could scarcely use her eyes at all, though they were perfectly healthy and emmetropic, and the acuteness of vision was normal. The external muscles seemed, as it were, to have dissolved partnership and each to act on its own account when she attempted to converge. Their irregular and variable action made anything like an accurate measurement of their force impossible.

The following is one of several cases in which there was occasional double vision from spasmodic action of one of the external muscles.

Miss M., a little below par in general health and of extremely nervous temperament, complained that frequently, without warning and without special exciting cause, as at the dinner table or at the opera, everything suddenly appeared double, and at the same time it was evident to her that she had lost control of the movements of one eye, which felt as if forcibly turned to one side. On closing the lids and pressing the ball for an instant, the symptoms would disappear. The acuteness of vision was normal, the balance of the external muscles for distant sight correct, and refraction nearly emmetropic. The correction of a hypermetropia of $\frac{1}{48}$ did not prevent the recurrence of the annoyance.

There is one more affection to which I wish to call attention; it is of especial interest because, though in this class of cases of little moment, it may be, in others, a symptom of very grave lesions. I refer to a temporary paresis of the elevator of the upper lid.

There is a great difficulty, sometimes an impossibility, of opening the eyes when rousing from sleep. Some patients are able to raise the lid naturally after several vigorous efforts of the will, while others are obliged to raise it with the fingers, and to rub or bathe it before acquiring control over its action.

This occurs always on awakening, whether in the morning, during the night, or after a nap in the daytime, and is naturally the occasion of much uneasiness. I have notes of four such cases occurring in delicate ladies and evidently of an hysterical character.

Two recovered entirely, though not very quickly, under the use of tonics; a third lived at a distance, and I saw her only once; and the fourth is still under treatment. In the last, the affection is of long standing, and is peculiar in the fact that for many months it was confined to one eye.

The patient, about eighteen months ago, had difficulty in opening the left eye on awakening, the trouble lasting, at that time, for a few weeks only. About a year ago it commenced again in the same eye, has persisted since, and during the last few months has involved the right eye also, though to a less degree. Always when tired or weaker than usual she has the annoyance to a much greater extent; at times she is almost free from it. Her health is very feeble, she has had attacks of ague, etc., and is subject to functional palpitation of the heart and nervous prostration. There have never been any brain symptoms.

The only example of this affection that I have seen in the case of a man, rather confirms the view of its hysterical character.

A gentleman, forty-two years of age, was sent to me on account of a violent attack of gouty irido-selerotitis in the right eye. For eight or nine months he had been the victim of the most excruciating sciatica, and slighter neuralgia of other parts of the body, with gouty inflammation of some of the smaller joints; and had been almost constantly under the effects of morphia by hypodermic injection. There had never been any pain in the head or face until the commencement of the iritis a week before I saw him, since when it had been unusually violent in the eyeball, and in the branches of the fifth pair on the affected side.

Coincidently with the other eye symptoms occurred this partial loss of control of the levator palpebræ. Always on awakening he was unable to raise either eyelid without the assistance of his hand, and had to bathe and rub the lids before regaining the power to raise them naturally. This sometimes occurred when he closed his eyes without falling asleep.

At the time of examination, he could easily wink rapidly, but if the eyes were closed tightly, or even gently for more than a few seconds, they could not be opened without assistance. The orbicularis seemed completely relaxed, and a

very slight touch only of the finger was necessary to enable the levator to act. His sensation was, as has been the case with all the other patients, as if the lid were unnaturally weighted, and too heavy to be raised in the usual way. This symptom gradually disappeared as the inflammation of the eye subsided, and in a little more than two weeks from its commencement there was full control over the lids. The attending physician, Dr. John M. Adler, tells me that, in the progress of the case, the patient's manner and some of his symptoms have frequently been very suggestive of hysteria. There has even been, after some of the more violent paroxysms of pain, a very copious flow of colorless urine.

I have not seen any reference to this affection in print, but on speaking of it to some of my friends in general practice, I find that they have met with cases. Of course, no careful practitioner would lightly set aside so suspicious a symptom, or pronounce it merely "nervous," without due investigation. The danger of doing so has been sufficiently impressed on my own mind by the fact that the first case that came under my observation, a good many years ago, ended fatally some months afterwards from an intracranial tumor of which this symptom had been the earliest indication.

GUNSHOT WOUNDS OF THE THORACIC AND ABDOMINAL CAVITIES.

By

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[Read June 7, 1876.]

The following cases of gunshot wounds, one penetrating the cavity of the abdomen, and the other penetrating the cavity of the thorax as well as the cavity of the abdomen, are interesting from the fact that they entirely recovered, though in both instances important viscera in these cavities were wounded.

Case I.—I was called to see L. H., a mulatto man, aged 28, at 12 o'clock on the night of the 24th of March. He stated that he had been shot with a pistol, by an officer of police, about an hour before. That after he was shot, he fell, and was then removed by his friends to a distance of some three squares. On examination I found a small bullet wound about half an inch directly above the right nipple, and that just below the fifth rib, the ball had entered the thoracic cavity. The man stated that at the moment he was shot he was standing at the foot of a stairway, and that the officer who shot him was standing about fifteen feet off, at the top of the stairway, being above and in front of him.

The exact direction of the ball was downwards, backwards, and inwards, and there was no wound of exit. The patient experienced but little shock. His pulse was 60 per minute, full enough, and soft. His respiration was 14. He com-

plained only of some pain in the region of the wound. There was no hemorrhage, and no indication of it. There was but little anxiety, and he had no fear; he seemed to be a stranger to it, and said he would soon be well.

A dossil of dry lint was placed over the wound and held in position by a strip of adhesive plaster, absolute rest was strictly enjoined, and he was ordered a grain of opium every two hours until three grains should be taken, at which period I intended to see him again. On visiting him at 8 o'clock the following morning, I found him very calm. His pulse was 64, respiration 18, and there was a slight crepitant râle over and below the wound. He had no pain, and his skin was in good condition. He wanted to get up and desired to eat his breakfast.

He was ordered a grain of opium four times a day, and some toast-water, and was told to keep perfectly still in his bed. On returning at six o'clock in the afternoon, I found him slightly under the influence of opium, and his sputum having a little blood at times in it, but very little. In every other respect he appeared to be doing very well. The opium was ordered to be suspended unless he should become restless, and then it was to be repeated every two hours. The next day I found that he had slept nearly all night; the opium had not been repeated; the blood still continued to be in his sputum, now and then, and the râle was about the same. The opium was continued, a grain four times during the day. In the evening the sputum had no blood in it, nor did it again appear.

On the morning of the 27th there was a decidedly yellow tinge of his conjunctiva, but he complained of no pain over his liver, and the slight râle in the region of his nipple, at the wound of entrance, had almost entirely ceased. In the evening he was very comfortable, having no pain in his chest or abdomen. He had taken four grains of opium during the day, and seemed to be but slightly under its influence. It was discontinued for the night.

On the 28th his condition was very good; he had slept well; his pulse and skin and respiration were normal in every respect. He did not appear to be conscious of the

injuries his body had received, and was anxious to be up and about. His opium was continued, and rest in the recumbent posture was directed to be maintained.

On the morning of the 29th, the dry lint dropped off when the adhesive strip was removed, and there were found only a few granulations in the wound, over which a piece of soap plaster was placed. He had slept well and was very anxious to have some milk in addition to his toast-water; a pint was ordered to be given him during the day. His bowels had been kept entirely at rest by the opium since he was shot. His four grains of opium were continued through the day.

On the 30th, six days after he was shot, he appeared to be perfectly serene in every respect. There was no anxiety as to the result on his part, and beyond the yellow tinged conjunctiva, there appeared no cause for anxiety, as indeed there was as yet but slight appearance of any injury remaining. His opium was continued, but only one grain given twice a day. The action of his bowels was controlled completely by this dose.

He was kept in bed, fed on milk and toast-water, and given two grains of opium daily, until the 11th of April, eighteen days after the reception of his injury: he was then given a plate of rice in addition to his milk, and, believing that his bowels could be moved then with impunity, a teaspoonful of castor oil was ordered to be given every three hours until there should be a movement. The following morning, the 12th of April, when I arrived I found him sitting over a *commode*, having had an evacuation of his bowels an hour before. He was now having a second motion. While talking with him, there was a slight bearing-down movement which brought into the vessel some fluid fecal matter; I heard a distinct click as it fell on the bottom of the vessel, and immediately on searching I found the bullet I now hold in my hand. Its weight is fifty grains, and it belongs to the pistols worn by the police force.

[Bullet exhibited.]

All treatment was now suspended; indeed that treatment, essential as it was, had been rest, and rest alone, especially of his bowels, enforced by opium and by diet. He was now permitted to walk about his room, and eat rice and bread with milk.

On the 21st of April, twenty-eight days after he was shot, he eloped, in order to escape the officers of justice, who were waiting to take him into custody.

In tracing this ball from its entrance into the thoracic cavity to its exit at the anus, we may believe from positive evidence that it wounded the lung, the liver, and the bowel.

That it wounded the lung we believe from the bloody sputum and the moist crepitant râle. That in passing from the thoracic cavity to the bowel it wounded the diaphragm, we may believe. And from the jaundiced conjunctiva, in connection with the fact that the ball entered the thoracic cavity at the fifth intercostal space and passed out of the anus, we may infer that this hepatic disturbance was caused by a wound of the liver. That the bowel was wounded is manifest; but where, and whether the large or the small bowel, or both, and whether they were wounded in more than one place, we are not permitted to know.

It would appear, from the absence of shock in this case, that the small bowel was not wounded, and that probably the ball was arrested by a mass of fecal matter in the large intestine. But as we know that wounds of the lungs and the liver are usually accompanied with considerable shock, and as we have reason to believe that these organs were wounded in this man, we may infer that the absence of shock in this case does not prove that the small intestine was not wounded.

The second case is one of gunshot wound of the abdomen.

Case II.—On the 19th of April I was asked to see John H——, a lad of 12 years, who had been shot with a pistol loaded with gravel, by a little companion who by accident discharged the pistol within four feet of his person, the load of gravel entering the cavity of the abdomen by means of four small ragged openings, all of them situated on the right side of the umbilicus, and within a space of three inches; the two openings which were nearest each other were about an inch apart. I saw the child within an hour after the accident had taken place.

There was considerable shock. The patient was anxious; his pulse was small, weak, and 120 per minute; there was no hemorrhage and no wound of exit. He was taken from the sofa where I found him and placed in bed. A little wine was given, and a dossil of dry lint was placed over each of the four wounds, and a larger piece placed over all of them, and held down by a strip of adhesive plaster. Absolute rest was enjoined. Three hours after, when I saw him again, he had begun to recover from his shock; he had taken about three ounces of sherry wine. Cracked ice was now given him, and half a grain of opium was ordered every two hours.

The next morning after the accident, the patient appeared to be doing very well. He complained of some pain in the region of the wound, but his pulse had gone down to 100, his skin was slightly moist and warm, his respiration, which was entirely thoracic, was 19 per minute. The opium was ordered to be continued, half a grain every four hours, and toast-water to be taken.

On the following morning I found him not so well; it was manifest that he was threatened with peritonitis. His skin was hot and dry, his respiration was 22, and his pulse 120. I drew eight ounces of blood from his arm, and gave him one-sixth of a grain of calomel and one-half a grain of opium every three hours, and half an ounce of liquor ammonii acetatis every hour.

Six hours afterwards, when I saw him, I found him more comfortable, his pulse had abated to 98, his respiration was 20, and his skin relaxed. The opium and calomel were continued during the night; the ammonia was given only every three hours.

The following day his condition was more favorable; his pulse 90, his breathing easy, and less pain in the region of his wounds; his peritonitis had well nigh abated.

This patient was kept under the influence of opium, and fed on low diet of a fluid nature for eleven days. On the twelfth day after the accident, milk and beef-tea were given him, and the opium suspended. Some farinaceous food was now ordered, and a teaspoonful of castor oil, to be given, and to be repeated if necessary, in order to induce an evacuation which he had not been permitted to have since his accident. The evacuations were ordered to be kept, and to be diluted with water and well examined to find if possible the gravel.

The following day, sixteen days after the accident, his mother gave me the four gravel-stones, which I now hold in my hand, and which she got out of his evacuation.

[Gravel exhibited.]

The four wounds in the umbilical region were not yet quite healed; he was kept in bed ten days longer, when he was perfectly well.

What parts of the intestinal tract were wounded in this lad we cannot positively know. That the three stones entering nearest the umbilicus went into the small intestine, we may believe, and that the gravel entering furthest to the right from the umbilicus, entered the ascending colon, we may believe also; but beyond this I cannot reason. All the gravel appeared, from what the mother told me, to have been evacuated at one time.

The treatment of these injuries in these two cases

was simple and efficacious. Rest, and this rest enforced and maintained by opium and by diet, was the entire treatment.

The practice of probing gunshot wounds of the great cavities of the body for missiles, or, indeed, for any purpose whatsoever, is entirely at variance with this principle of rest, and in my opinion is as pernicious as possible. Several cases have of late attracted public attention, in which this practice has been pursued, and in which, a fatal termination having followed, it has been brought to light during trials for homicide in our courts; notably the case of Fiske, who was shot in his abdomen by Stokes, in New York.

It is not difficult to trace this practice to its source. It in part arises from the desire of the surgeon to remove the foreign body, which he believes will give rise to greater trouble by remaining, than any effort on his part to remove it can accomplish. An error in judgment. The patient, too, believing himself in more peril while the ball is in him than any search for it could make, is anxious.

Thus to carry out his own judgment, to satisfy his patient, and to accomplish so desirable a triumph in the presence of anxious friends, and perhaps to have his name published to an admiring world, the surgeon is tempted to search—perhaps with only a finger, "that best of all probes"—and thus to perform an act which, more than probable, he will have ample leisure to repent.

Some authors, too, of weight, from a loose if not an ambiguous way of expressing themselves on this point, give a *quasi* approbation to this practice of

probing gunshot wounds of the cavities, when the missile remains. The accomplished Hennen, usually so exact and perspicuous, is on this point at fault. In the second edition of his Military Surgery, in the 19th chapter, the one on gunshot wounds of the abdomen, at page 401, he thus expresses himself: "The search for extraneous bodies, unless superficially situated, is altogether out of the question, except they can be felt by a probe." He adds, "as in Ravaton's case (Chir. D'Armée, p. 241)." And Cooper, in his Dictionary of Surgery, repeats the expression as the highest authority. And of late other surgeons have followed in the beaten tract. The phrase "except they" (the extraneous bodies) "can be felt by the probe," implies that the probe may be used, nay more, that it must be used.

Mr. Longmore, in his excellent article on gunshot wounds, in Holmes's System of Surgery, speaking of penetrating wounds of the abdomen, says, "The ratio of recoveries after these wounds in both the French and English armies in the Crimea was very small. Out of 124 penetrating wounds of the abdomen in the English Army, 115, or 92.7 per cent., died; out of 121 in the French Army, 111, or 91.7 per cent., died."

In our own war, Dr. Otis (Medical and Surgical History, Part II., Vol. II., Surgical History, p. 202) tabulates 3717 cases, of which 3031, or over 81 per cent., terminated fatally.

Mr. Longmore also states that "recoveries after penetrating wounds of the small intestines by gunshot are very rare;" he says "if the liver be wounded, death usually results from primary hemorrhage, or from inflammation consequent upon extravasation into the

peritoneum. In a few instances patients have recovered after gunshot wounds involving this viscus. About twelve instances altogether have been published by Guthrie, Hennen, Cooper, and others who were engaged in military practice during the Peninsular campaigns. Only one case is known to have survived from the Crimean war."

The record of our late war, however (Otis, op. cit., p. 148), "supplies thirty-two examples not to be excluded, by the most rigorous analysis, from the category of recoveries from shot wounds of the liver."

CASE

OF

CALCULOUS AND CYSTIC DEGENERATION OF BOTH KIDNEYS.

By

J. CHESTON MORRIS, M.D.

[Read June 7, 1876.]

Miss E. R. enjoyed good health until thirteen or fourteen years ago, when she suffered for a long time from a singular cough, considered as spasmodic and nervous by Drs. Caspar Morris and C. W. Hornor, who then attended her. After her recovery she remained well until the fall and winter of 1866–67. She had spent the previous summer at the Water-Gap, and climbed and walked about a good deal. On her return she complained of rheumatoid pains in her right leg, which grew worse until January, when Dr. Morris advised rest in bed, and, as the limb was becoming rigid, applied a splint. Her pains continued to increase. About this time she voided with the urine several small calculi. As there was no abatement in her sufferings, but, on the other hand, the left leg began to be similarly involved, Dr. Agnew was called in consultation.

Prior to this I had seen her for my father, Dr. Caspar Morris, during his absence from the city.

The opinion of Drs. Morris and Agnew was that we had a case of caries of the spine to deal with (as a sister of the patient, who presented many similar symptoms, had previously died of that disease). I suggested that it might be a case of reflex irritation, due to an extremely anteflexed uterus which I had detected in treating her for dysmenorrhœa. As this suggestion gave a ray of hope, it was agreed that I should try what could be done on this hypothesis. I accordingly etherized her, broke up the false adhesions which had formed around the knee and ankle-joints, and placed a Simpson's galvanic intra-uterine pessary (as modified by me) in position. As the irritation subsided, passive motion was instituted; and, as soon as possible, she was recommended to use active exercise. This she did, and improved rapidly, so that in three or four months from the commencement of my treatment, and fourteen months from the time of her going to bed, she was walking about, not only in town, but in West Philadelphia, moving about as freely as before her sickness.

The pessary was then removed; and she appeared to be perfectly well from the early summer of 1868 until the spring of 1870, when she began to suffer with a very severe cough, not accompanied with much expectoration, nor with physical signs of anything more than bronchial congestion. But the prostration of strength was very great: rapid pulse, hectic, profuse night sweats, yawning spells, and a cough almost continuous and not relieved by any medication, made me fear that some form of tuberculosis was setting in. She was carried to the seashore, whence she returned in September, quite well.

From this time I only saw her casually, until the autumn of 1875, when she sent for me on account of debility which she had been feeling for a month or two previously. I then ascertained that she was passing from three to four quarts of urine daily, heavily loaded with pus and blood. She told me this had been the case for nearly five years, but she had not thought it of much consequence, as she was pretty well in other respects.

An obscure fulness or swelling was found in the right side of the abdomen. The uterine sound showed a slight amount of anteflexion, but the menses having ceased for several years, and the uterus evidently undergoing the senile atrophy, this was disregarded. The sound was introduced into the bladder, and penetrated some eight or nine inches, apparently in the direction of the fulness; no defined tumor, however, could be made out. There was rather an increase of pus and blood during the following days. Dr. Rodman met me in consultation, but nothing further was elicited. Tonics, good diet, and uva ursi in decoction, seemed to lessen the quantity and improve the character of the urine, but she rallied slowly. The success of the previous uterine treatment induced me at her request to resort again to an intra-uterine pessary, this time a hard-rubber stem, with Dr. Thomas's vaginal support. But a sore throat, of which she had begun to complain a day or two previously, put on a gangrenous diphtherial character, and she died after four days' illness on May 7, 1876, aged 49 years.

At the autopsy, the bladder was found but little altered; the uterus well supported, free from irritation, but with thin walls readily folding over into ante-

flexion; the ovaries healthy, but atrophied; the spinal column healthy. The kidneys were both reduced to cysts, or a collection of cysts rather, containing a number of phosphatic calculi. Several if not all of these communicated with the pelves of their respective kidneys. But the pyramids and cortical structure of the organs had nearly all disappeared; and the remaining tissue was soft and easily torn, in some places seeming ready to break down. The cysts contained pus; one of them was broken in removing the kidney. The other organs were not examined.

CASES

OF

SARCOMATOUS TUMOR: I. OF THE LOWER JAW INVOLVING THE MASSETER MUSCLE; II. OF THE PAROTID GLAND INVOLVING THE MASSETER MUSCLE; REMOVED BY OPERATION.

By

J. EWING MEARS, M.D.,

SURGEON TO ST. MARY'S HOSPITAL, PROFESSOR OF ANATOMY AND CLINICAL SURGERY IN THE PENNSYLVANIA COLLEGE OF DENTAL SURGERY, DEMONSTRATOR OF SURGERY IN THE JEFFERSON MEDICAL COLLEGE.

[Read June 7, 1876.]

The two cases of sarcomatous tumor, to which I beg to direct the attention of the Fellows of the College this evening, presented in their external appearances and in other symptoms such sufficiently well-marked resemblances as to induce me to offer them for consideration together. Differing as to point of departure, they were brought into close relation in the process of development by the involvement of similar structures.

Case I.—The first case was one of peripheral osteosarcoma, taking its origin in the periosteum of the lower jaw, in a boy twelve years of age, a resident of Delaware, who was brought to my clinic at the Pennsylvania College of Dental Surgery, in the month of October, 1873. The following

history with regard to the cause of the tumor was obtained at that time: In the month of July preceding, whilst in bathing, he received a severe blow upon the left side of the face over the region of the lower jaw, caused by coming in contact with the head of one of his comrades as he sprang into the water from the pier. At the time of the receipt of the injury he experienced considerable pain, and, soon after, swelling supervened. The soreness in the part gradually diminished and finally disappeared, leaving, however, a slight enlargement. This was so slight as to produce no deformity, and in a few weeks the accident and its results were dismissed from mind.

During the course of the summer, attention was attracted to a swelling of the face, which was attributed to a suspected decayed tooth which had been attacked by cold. The usual remedies employed in such cases were applied without causing the disappearance of the swelling, and the boy was placed under the care of a physician in the town in which he resided. At first the physician was disposed to regard the swelling as due to the cause ascribed by the members of the family, and directed treatment accordingly. Failing to obtain the results expected from the treatment, he was led to make a more careful and extended examination, and arrived at the conclusion that the case was of a more serious nature; he then advised that the patient should be brought to the city and placed under the care of a surgeon.

On examination the left side of the face was found very much enlarged, the swelling occupying more particularly the region of the lower jaw, the greater portion of the body, the angle and ramus. To the touch it was hard, dense, and inelastic, and firmly attached to the bone. The overlying tissues were freely movable and yielding. The finger introduced between the cheek and the teeth into the buccal space could distinctly trace the attachment of the growth to the lower jaw. The external surface of the upper jaw was normal and the canine fossa intact, showing the antrum to be free from disease. There was almost entire occlusion of the

jaws, the patient being able by great effort to separate them to the extent of but one-quarter of an inch. In order to examine the internal surface of the lower jaw it was necessary to give the patient ether and forcibly separate the jaws by a lever, when the internal surface was found normal and not in any way affected by the tumor. The introduction of the exploring needle into the mass from the inside was followed by an escape of blood.

At no time during the development of the growth had pain been a prominent symptom. The increase in size had been very rapid, and the occlusion of the jaws compelled the patient to confine himself to the ingestion of liquid food. His general health was not notably impaired. Having determined the nature of the growth and its position, I advised its immediate removal, which was acceded to, and the operation was performed at the residence of the patient, Drs. R. R. Taylor and Parish, of this city, and Dr. Harmon, U. S. Navy, being present and assisting.

Owing to the closure of the jaws, I found it impractible to effect removal by an internal incision, and therefore employed an external incision, beginning just below the lobule of the ear, carrying it downwards to the angle of the jaw, along the posterior border of the ramus, and thence forward along and slightly posterior to the inferior border to a point within one inch of the symphysis. The facial artery was secured at the anterior inferior angle of the masseter muscle, where it mounts upon the jaw, and divided. Dissecting the skin and superficial fascia upwards to some distance, a freely movable flap was formed, which, on being raised, exposed the upper portion of the tumor. In order to reach its attachments below, it was found necessary to detach the superficial structures to some extent into the region of the neck posteriorly. The masseter muscle at its insertion was incorporated in the tumor; above, to one-third of its extent, it was free, and, on being divided, retracted to its points of origin. Having fully exposed the tumor, an effort was made to separate it from the jaw by the knife; but this was found impossible,

and recourse was had to the chisel, by which it was detached, removing with it the external plate of the bone softened and disintegrated to the extent of attachment of the tumor; posteriorly, the growth passed over the border of the ramus, and penetrated the deeper structures of the neck, overlying the external carotid artery; this portion was removed by careful dissection, and the rough spiculated surface of the bone was thoroughly scraped by the chisel.

Fig. 1.

Having ascertained by a careful examination of the part that all of the morbid structure was removed, the wound was closed by six iron-wire sutures, a compress and bandage were applied, and the patient was placed in bed. At the expiration of three weeks the greater portion of the incision

had united, a sinus remaining, through which small spicules of bone were discharged; the boy was sent to the country, and in the course of two months the sinus closed; since then he has enjoyed uninterrupted good health, and has been able to resume his studies in school. The occlusion of the jaws was at once relieved by the operation, and they can now be separated to the normal extent.

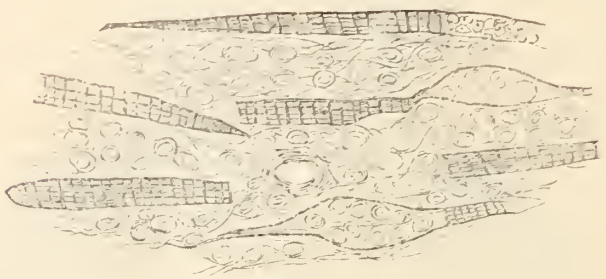
Fig. 2.

The photographs which are exhibited show very accurately the appearance of the face before and after the operation. (Figs. 1 and 2.) The cicatrix is seen

in a portion of its extent at which it is adherent to the bone; the remainder, which is free, is concealed from view beneath the border of the jaw. It will be observed that there is a slight puffiness of the cheek, with a scarcely perceptible drooping of the eyelid, and dropping of the corner of the month—conditions which are due to a limited facial paralysis which followed the operation; the puffiness is also to some extent rather apparent than real, owing to the destruction of the contour of the face by the removal of the prominent angle of the jaw and partial adhesion of the cicatrix.

The microscopic drawing, kindly furnished by Dr. Bertolet (Fig 3), exhibits a very interesting condition

Fig. 3.



which he observed had occurred in the masseter muscle. and which he fully describes in the accompanying note.

The sarcomatous tumor removed from the jaw of the boy presents the microscopical appearances of a small round-celled structure with a delicate, finely granular, occasionally fibrillated intercellular tissue. It also contains numerous striated muscular fibres; many of them being found in the several stages of fatty degeneration and atrophy. But there are also some muscular fibres, which are of great interest, showing,

what I believe to be, intra-muscular sarcoma. These fibres exhibit at many points such a decided increase in the number of nuclei of the muscular substance by segmentation, while at the same time the general appearance of the cells thus formed, as well as their reaction under various chemical reagents, is such as to leave scarcely any doubt that the proliferation within the sarcolemma is of a sarcomatous nature, and not due to mere inflammatory processes.

These intra-muscular cells, still inclosed by the sarcolemma, have a round, occasionally an oval shape; a large nucleus which is readily stained with carmine and surrounded with a thin layer of protoplasm. In size, these cells equal those of the primary growth. They are not always uniformly disseminated throughout the length of the muscular fibres, but are often so aggregated as to completely fill out and distend the lumen of the cylinder. At a few points, where the growth of the sarcoma has been more rapid in the muscles than the invasion of the fibrillated structure of the perimysium, a parallel course is still maintained by the sarcomatous muscular fibres. The sarcous elements seem to passively disappear under the pressure of the newly formed cells without previously becoming granular or fatty. The transverse and longitudinal structures of the muscular fibres finally disappear entirely, and naught but cylinders filled with round cells, each separated by a fibrillated intercellular tissue, remain, *i. e.*, the muscular substance has been transformed into young cellular connective tissue, and sarcomatous cells have been differentiated. At places the sarcolemma has been destroyed, and the muscular fibres there present a uniform sarcomatous tissue.

The majority of the muscular fibres seen in this tumor are undergoing passive changes, but in a few of them the active proliferation of the muscular nuclei, described above, has taken place, which are not primary but secondary changes induced by the sarcoma.

Sokolow[1] was the first to demonstrate this active participa-

[1] Virchow, Archiv, Bd. 57, S. 321.

tion of the muscles in a spindle-celled sarcoma. I think this specimen conclusively proves that the muscular nuclei also can, and do, participate in the formation of the round-celled variety of sarcoma.

Case II.—The second case was one of sarcoma of the parotid gland of the right side, occurring in a patient who was admitted into the surgical wards of St. Mary's Hospital, in the summer of the year 1874, for a swelling which occupied the right side of his face.

He was 58 years of age, and a furrier by trade. He had enjoyed good health until two years ago, when he had a partial attack of paralysis involving the right side. This condition interfered somewhat with his work, but was not sufficient to compel him to abandon it. Three months prior to his admission he noticed a slight swelling upon the right side of the face, and at the same time experienced difficulty in opening his mouth to the usual extent. The swelling increased quite rapidly, and with its increase in size the occlusion of the jaws became more marked. A physician was consulted, who, regarding it as an inflammatory swelling, ordered sorbefacient applications. No benefit appeared to be derived from the treatment pursued, and the patient came to the hospital.

At the time of his admission the tumor had grown to quite a large size (Fig. 4), and the occlusion of the jaws was nearly complete. An examination revealed the fact that the parotid gland and the masseter muscle were involved, and the jaw itself was supposed to be implicated. The removal of the growth having been determined upon, it was exposed by an incision extending from the zygoma downwards, in front of the ear, and along the border of the ramus and body of the jaw to within an inch and a half of the symphysis. The flaps formed by this incision were freely dissected upwards upon the cheek, and downwards upon the neck, and the tumor consisting of the parotid gland and the entire masseter muscle was removed. The facial and external carotid arteries

were in turn ligated—the facial before, and the external carotid artery after division. The jaw was found to be free from disease. The wound was closed by iron-wire sutures, and a compress and bandage were applied. Considerable suppuration ensued before the wound finally healed, which occurred four weeks after the operation.

Fig. 4.

The removal of so large a portion of the facial nerve as was necessary in performing the operation, intensified the facial paralysis which already existed. The patient is now in very good health. (Fig. 5.) There is no evidence of any return

of the disease. The occlusion of the jaws was entirely relieved by the operation.

Fig. 5.

Dr. Bertolet has made a microscopic drawing of the tumor (Fig. 6), showing the involvement of the fibres of the masseter muscle as in the previous case.

The tumor removed from the parotid region is made up of large, round, and spindle-cells, together with a sparse, finely fibrillated, intercellular substance.

Certain portions of the growth reveal the presence of a

glandular structure, also ducts lined with cylindrical epithelium, thus showing that a secondary invasion, if not primary involvement, of the parotid gland, exists. There is no excessive development of the epithelial lining, no formation of atypical epithelium, no ingrowing epithelial papillæ; but, on the other hand, the glandular parenchyma is widely separated, often compressed by an exuberant formation of sarcomatous elements in the surrounding connective tissue. The accompanying microscopic drawing shows the appearance of this invading sarcomatous tissue.

Fig. 6.

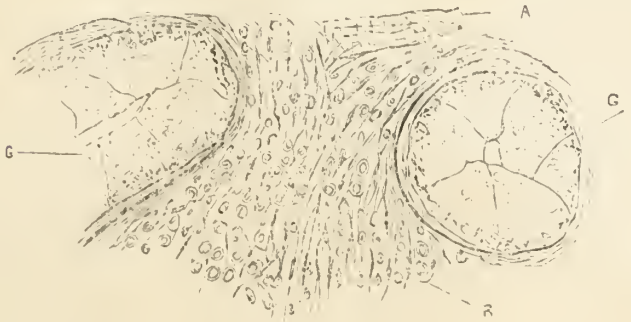


Fig. 6.—A, Artery;
G, Parotid glandular structure;
R, Infiltration of intercellular substance with sarcomatous tissue.

The sarcoma has likewise invaded the masseter muscle, and here it also seems to principally spread along the connective tissue of the perimysium, though in a few of the muscular fibres the same proliferation and accumulation of sarcomatous cells from the nuclei of the muscular fibres is seen as noted in the other specimen (see page 171). These two specimens very clearly show that an intra-muscular formation of sarcomatous tissue is one of the possible modes of secondary sarcomatous invasion.

In the further consideration of these cases, it may be of interest to examine somewhat into certain

features which seem to belong peculiarly to them. In general, it may be said that they illustrate the usual history of sarcomatous growths, and yet present such marked variations as to entitle them to a certain claim of distinction, in a clinical as well as a pathological point of view.

With regard to the latter, Dr. Bertolet has clearly described the very interesting condition which he observed to have occurred in both cases, that is, infiltration of the adjacent muscular tissue by the sarcomatous growth, an unusual feature, and one which belongs essentially to carcinomatous formations in marked contrast to sarcomas, which are usually encapsulated.

Clinically, the cases are of interest in the very rapid development of the tumors. In the first case, in which the cause was distinctly traced, a large size was attained in four months, and whilst under observation its growth was quite apparent; in the second case the increase in size was equally rapid. According to Billroth (Surgical Pathology), sarcomatous tumors of the parotid gland grow very slowly, and particularly so when they do not form until middle age.

The time of life at which the tumors appeared may be regarded as a departure from the rule which seems to govern them. Without regard to the tissue implicated, they are described as of rare occurrence between the ages of ten and twenty years, and as still rarer in old age. In the salivary glands they rarely occur after the fortieth year. In the cases under consideration, the disease manifested itself in early life, and somewhat after middle life.

As to the origin of the tumor of the jaw, it is quite evident that it was periosteal in character; the injury received developing the morbid action in the inner layer of the periosteum, and thus giving rise to a true periosteal sarcoma. The history, in the case of the tumor of the parotid gland, gives no information as to a cause, and it may be a question whether the involvement of the gland was primary or secondary.

The absence of any recurrence of the disease in the cicatrices and of any symptoms of metastatic formation up to this period of time after extirpation of the tumors, would permit a reasonably favorable prognosis to be made. This immunity was not to be expected in the second case, owing to the age of the patient; at his time of life speedy return of the disease being the rule. The prognosis in the case of the boy was favorable as to his age, but unfavorable as to the character of the growth, periosteal sarcomas being regarded as quite malignant in their nature.

Extirpation is the only method of treatment to be pursued, and great care should be taken to remove all of the morbid tissue.

CASE

OF

DIABETES INSIPIDUS TREATED BY ERGOT AND GALLIC ACID.

By

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[Read July 5, 1876.]

My apology for presenting the history of this single case of Diabetes Insipidus is the exceeding rarity of the affection, and our almost total ignorance of its nature, pathology and therapeutics; although to the former two my own case unfortunately contributes nothing.

C. H. W., aged 24, an American, and a sawmaker, first consulted me August 9, 1875. Two years before that date he noticed that he passed more urine than seemed natural, but he could not say that he was otherwise ill. His appearance is not that of a sick man, and he says he gains rather than loses weight. His appetite and digestion appear good, but he drinks a very large quantity of water. At this visit he was directed to measure the twenty-four hours' urine, and return in a week.

On August 16, he reported that he found he passed about ten pints a day, that is 160 fluidounces, or 4732 cubic centimetres; this amount was not strictly accurate, but

approximately so. This evening he brought a specimen of the urine, which was found to be almost colorless, with a specific gravity of 1002, and without sugar.

Having in my mind the case reported by Prof. Da Costa in the last volume of the Transactions,[1] I ordered him to take a fluidrachm of wine of ergot three times a day. On August 23, a week later, he returned, saying he thought he was passing certainly not more urine than he did, perhaps a little less, but he had not measured accurately. Only once in the past week did he have occasion to rise at night; heretofore, he has had to do so quite frequently. The *fluid extract* of ergot was now substituted for the wine, to be taken as often.

On August 30, he reported that he did not have to get up at night once during the past five nights. The specific gravity of the urine was now 1010. On September 14, he reported the quantity of urine so reduced that he micturated but four times in the twenty-four hours, and passed not more than a pint at a time. This state of affairs continued for about five days, after which, notwithstanding the fact that he continued the ergot, the quantity again increased, and he was now (September 14) urinating about ten times in the twenty-four hours; never having, however, to rise at night, although he goes to bed at ten and gets up at six. He thought he passed about a pint each time. The urine he brought this evening was almost quite colorless and had a specific gravity of 1001. The fluid extract of ergot was now increased to *two* fluidrachms thrice daily, to be taken on an empty stomach.

On September 21, he reported about the same frequency of micturition and the same quantity each time; also, that he has now to rise once during the night for this purpose. On September 27, the sp. gr. was scarcely more than 1000, and the urine almost colorless, quantity about the same. He has

[1] Transactions of the College of Physicians of Philadelphia, 3d series, vol. i. p. 139.

been very thirsty, but did not observe the quantity of water consumed.

It was now thought best to change the treatment, and he was ordered 15 grains of *gallic acid* three times a day on an empty stomach, and told to measure the quantity of urine passed and of water drank. On October 5, the urine was of a pale yellow color, with a sp. gr. of 1016, and its daily quantity much diminished. For the first five days after beginning the use of the gallic acid, he thinks he did not pass more than one and a half pints, or twenty-four fluidounces (709 c.c.), in the twenty-four hours, and what he passed was darker in hue than the specimen brought this evening. The quantity is most probably underrated, but the fact that the urine was darker in hue than the specimen brought to me is presumptive evidence that the twenty-four hours' quantity was smaller rather than larger, the amount of coloring matter of the twenty-four hours being usually uniform. At the end of the five days referred to, when his supply of gallic acid was exhausted, the quantity began again to increase, so that he estimates the twenty-four hours' urine at 96 fluidounces (2842 c. c.); color like that brought to me October 5. The same treatment was continued.

On October 12, he brought me two specimens of urine passed that day, one in the morning and the second in the evening. The morning urine was pale yellow in color and had a specific gravity of 1012; what passed in the evening was lighter in hue, but presented the same specific gravity. He estimated the twenty-four hours' quantity at about sixty fluidounces, micturating about seven times in the twenty-four hours. He had also much less thirst.

He was now directed to continue the treatment for one week longer, taking fifteen grains four times a day, after which he was to discontinue it. He was also asked to report again after a couple of weeks, that I might find out whether the improvement was permanent. He did not do so, however, nor have I seen him since.

It must be admitted that there are two circumstances in the history of this case which are unsatisfactory. The first is the fact that there is a want of accuracy in the measurements of the urine, incident to the circumstance that the case was an office instead of a hospital case, in which alone the facilities for accurate daily measurements exist. But when we compare the specific gravity of the urine determined by myself from specimens brought to me, with the approximate measurements made by the patient himself, it is certain that they were not very far amiss. Second, the patient passed from observation before it could be determined with certainty that the improvement which ensued upon the use of gallic acid was permanent.

But notwithstanding these facts, I think the case is one whence conclusions may be legitimately drawn. First with regard to ergot. Although its use seemed at first to be followed by a diminution in the twenty-four hours' quantity of urine, and an increase in the specific gravity, this improvement was but temporary, and at the end of six weeks' fair trial, during the latter part of which he took six fluidrachms of the fluid extract a day, the urine was actually scarcely heavier than water, and the daily amount correspondingly large. This of course in no way disproves the efficiency of ergot in the treatment of simple polyuria, but adds one to the list of cases in which the results were negative. Still less does the effect which seemed to follow the use of gallic acid prove its curative power in the treatment of the affection. And it must be admitted that it would be less justifiable to infer such power over the disease than that of ergot in the

hands of Dr. Da Costa, since the case is incomplete; while on the other hand, the results are sufficient to encourage a further trial of the drug in a similar case.

As to the mode of action of the gallic acid, it is well known that it is a much feebler astringent than its anhydride, tannic acid. At the same time it is also true that tannic acid is a coagulator of albumen, and, therefore, incapable of absorption, and that when administered by the stomach, a portion of it is first converted into gallic acid, which is readily absorbed; the remainder may for the most part be recovered from the stools as tannate of albumen or gallic acid.[1] Finally, the gallic acid introduced into the circulation by absorption or otherwise *escapes through the kidneys.* Thus we have the direct action of an astringent on the walls of the capillaries and uriniferous tubules, and it is not unreasonable to suppose that the effect will be to render them less permeable to the watery constituents of the blood, the separation of which by filtration and osmosis constitutes the essential part of the act of secretion of urine. Less unreasonable by far than to expect an effect of gallic acid absorbed into the blood upon the bloodvessels of the lungs, in pulmonary hemorrhage, in which condition it has some reputation.

I have not taken the time to consult authorities with a view to determine whether this remedy has suggested itself to others in the treatment of *diabetes insipidus;* doubtless it has. Its use in albuminuria is based on the same view of its physiological action.

[1] H. C. Wood's Therapeutics and Materia Medica, 1st ed., p. 25.

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